SONY

CAMERA ADAPTOR

CA-TX7
CA-TX7P

SERVICE MANUAL

Vol. 1 (1st Edition)

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TABLE OF CONTENTS

1. OPERATING INSTRUCTIONS

2. SERVICE INFORMATION

2-1. BOARD LAYOUT 2-1
2-2. DISASSEMBLY/INSTALLATION OF MAIN PART 2-1
2-2-1. Removal of Cabinet 2-1
2-2-2. Installation of COAX connector 2-2
2-2-3. Replacement of DC/DC Converter 2-3
2-2-4. Replacement of Multiplex (MPX) Filter 2-4
2-3. CONNECTOR AND CABLE 2-6
2-3-1. Connector Input/Output Signals 2-6
2-3-2. Connection Connector 2-10
2-3-3. Wiring Diagram for Cable 2-10
2-4. SWITCH FUNCTIONS ON BOARD 2-11
2-5. CIRCUIT DESCRIPTION 2-13

3. ALIGNMENT

3-1. PREPARATIONS 3-1
3-1-1. Equipment Required 3-1
3-1-2. Notes on Adjustment 3-1
3-1-3. Connections 3-2
3-1-4. Initial Setting 3-3
3-2. MA-81 BOARD ADJUSTMENT 3-3
3-3. AFM-15 BOARD ADJUSTMENT 3-4
3-3-1. MIC 1 RF Adjustment 3-4
3-3-2. MIC 2 RF Adjustment 3-4
3-3-3. MIC 1 Deviation Adjustment 3-4
3-3-4. MIC 2 Deviation Adjustment 3-5
3-3-5. INCOM RF Adjustment 3-5
3-3-6. INCOM Deviation Adjustment 3-6
3-3-7. DATA RF Adjustment 3-6
3-3-8. INCOM Demodulation Adjustment 3-7
3-3-9. PGM Demodulation Adjustment 3-8
3-3-10. DATA Demodulation Adjustment 3-9
3-3-11. H CONT Demodulation Adjustment 3-9
3-4. YM-15 BOARD ADJUSTMENT 3-10
3-4-1. VCO 45 MHz Adjustment 3-10
3-4-2. Y Level Adjustment 3-10
3-4-3. Y/SKIN DC Balance Adjustment 3-11
3-4-4. Y/SKIN 90° Adjustment 3-11
3-4-5. R-Y Level Adjustment 3-12
3-4-6. B-Y Level Adjustment 3-12
3-4-7. R-Y/B-Y Carrier Balance Adjustment 3-13
3-4-8. R-Y/B-Y DC Balance Adjustment 3-13
3-4-9. R-Y/B-Y 90° Adjustment 3-14
3-4-10. 67.5 MHz Trap Adjustment 3-14
3-5. YD-25 BOARD ADJUSTMENT 3-15
3-5-1. Return Video Demodulation Adjustment 3-15
3-5-2. Return VBS Level Adjustment 3-15
3-5-3. Return Video Level Adjustment 3-16
3-5-4. RX PROMPT VIDEO Demodulation Adjustment 3-17
3-5-5. RX PROMPT VIDEO RF AGC Adjustment 3-18
3-5-6. RX PROMPT VIDEO Level Adjustment 3-19
3-5-7. TX PROMPT VIDEO Demodulation Adjustment 3-20

MANUAL STRUCTURE

Purpose of this manual

This manual is the Service Manual Vol.1 of the CAMERA ADAPTOR CA-TX7 and CA-TX7P .
This manual contains the operation manual related to the operations of this equipment, the replacement of the parts and adjustments.

Related manuals

In addition to this Service Manual Vol.1, the following manual is provided.

- **Service Manual Vol.2**
  Part No. 9-977-289-21
  Contains semiconductor pin assignments, parts lists, block diagrams, board illustrations and schematic diagrams.

SECTION 1
OPERATING INSTRUCTIONS

This section is extracted from operation manual.

3-853-844-11(1)

SONY

Camera Adaptor

Operating Instructions
Before operating the unit, please read this manual thoroughly and retain it for future reference.

CA-TX7/TX7P

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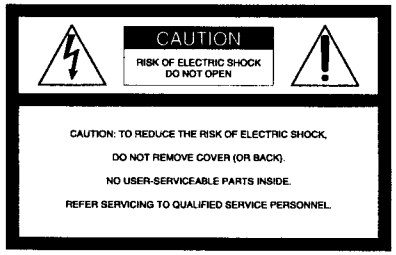
WARNING

To prevent fire or shock hazard, do not expose the unit to rain or moisture.

To avoid electrical shock, do not open the cabinet. Refer servicing to qualified personnel only.


CAUTION
RISK OF ELECTRIC SHOCK
DO NOT OPEN
CAUTION: TO REDUCE THE RISK OF ELECTRIC SHOCK,
DO NOT REMOVE COVER (OR BACK).
NO USER-SERVICEABLE PARTS INSIDE.
REFER SERVICING TO QUALIFIED SERVICE PERSONNEL.

This symbol is intended to alert the user to the presence of uninsulated "dangerous voltage" within the product's enclosure that may be of sufficient magnitude to constitute a risk of electric shock to persons.

This symbol is intended to alert the user to the presence of important operating and maintenance (servicing) instructions in the literature accompanying the appliance.

For the customers in the USA

This equipment has been tested and found to comply with the limits for a Class A digital device, pursuant to Part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference when the equipment is operated in a commercial environment. This equipment generates, uses, and can radiate radio frequency energy and, if not installed and used in accordance with the instruction manual, may cause harmful interference to radio communications. Operation of this equipment in a residential area is likely to cause harmful interference in which case the user will be required to correct the interference at his own expense.

You are cautioned that any changes or modifications not expressly approved in this manual could void your authority to operate this equipment.

This device requires shielded interface cables to comply with FCC emission limits.

Table of Contents

Overview **4**
Location and Function of Parts **5**
Front and Left Side 5
Switches and Knobs on the Rear and Right Side 7
Connectors on the Rear and Right Side 9
Mounting on Video Camera **11**
Notes on Use **14**
Specifications **15**

Overview

The CA-TX7/TX7P Camera Adaptor, which is docked with a DXC-D30/D30P or DXC-637 series Color Video Camera, allows connecting the camera to the CCU-TX7/TX7P Camera Control Unit via a triaxial cable.

Component signal transfer method

This unit enables transfer of Y, R–Y and B–Y signals for high picture quality.

Long-distance transfer

The maximum triaxial cable length that can be used to connect this unit to a camera control unit is max. 750 m (when using a Belden ø8.5 mm cable) or 1125 m (when using a Belden ø13.2 mm cable).

Electrical shock prevention function

To prevent electrical shock, this unit shuts off any high-voltage power supply whenever there is an incomplete connection.

Coaxial cable connection

When necessary, this unit can be connected to a camera control unit via a coaxial cable.[1)]

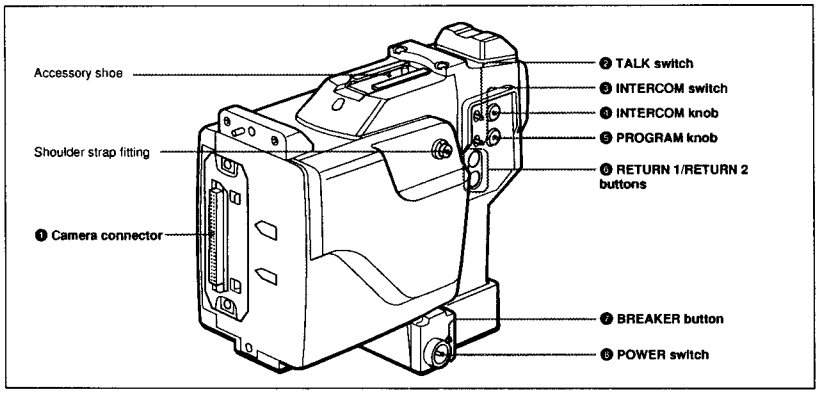
Variety of input/output connectors

Input/output connectors for the following signals are provided:
- Video signal output for teleprompter
- Return video signal output
- Intercom/program output for connected headset
- Microphone or line-in audio input
- Lens or tripod head control signal output

1) This unit's triaxial connector must be refitted to enable connection of a coaxial cable. Consult your Sony dealer for details.

Location and Function of Parts

Front and Left Side



❶ Camera connector (PRO 76-pin DIGITAL or PRO 50-pin)
Connects to the camera's VTR connector. Two types of connectors are provided and can be replaced according to the camera.

PRO 76-pin DIGITAL: Use this connector for docking with the DXC-D30/D30P digital video cameras.

PRO 50-pin: Use this connector for docking with the DXC-637 series analog video cameras.

For details on replacing these connectors, see "Mounting on video Camera" on page 11.

Note

Use a DXC-D30/D30P with ROM of ver. 1.1 or later. For version check and ROM change, consult your Sony dealer.

❷ TALK switch
Selects whether or not to transfer intercom audio from the camera to the camera control unit.

ON: Transfers intercom audio from camera to camera control unit.

OFF: Do not transfer intercom audio from camera to camera control unit.

REMOTE: Transfers intercom audio from camera to camera control unit only while the VTR START button on camera or lens is being pressed.

❸ INTERCOM switch
Selects the channel for transferring intercom audio.

CH1: Selects CH1 (channel 1).

CH2: Selects CH2 (channel 2).

Note

When the LINE switch on the CCU-TX7/TX7P Camera Control Unit is in the PRIV position, the intercom operates only between the camera and the camera control unit regardless of the INTERCOM switch position.

❹ INTERCOM knob
Adjusts the intercom audio reception level.
When using a DXC-D30/D30P, setting the TALK switch ❷ to REMOTE will enable this knob to adjust both the intercom audio and program audio levels. (Both levels can be adjusted using the audio level knob on the DXC-D30/D30P's front panel.)

❺ PROGRAM knob
Adjusts the program audio reception level.
When using a DXC-D30/D30P camera, setting the TALK switch ❷ to REMOTE will enable this knob to adjust the balance between the program audio and intercom audio levels. Turn clockwise to raise the program audio level, and turn counterclockwise to raise the intercom audio level.

❻ RETURN 1/RETURN 2 buttons
Select the return video signal[1] to be output from the RETURN OUT connector and to the camera's viewfinder.
Press the RETURN 1 or RETURN 2 button to select the return video signal 1 or return video signal 2 from the camera control unit.
To show the shooting picture on the viewfinder screen, release the button. The return video signal which selected last is still output from the RETURN OUT connector if the button is released.

❼ BREAKER button
The power to this unit is cut off when the circuit breaker is activated by a power source or connection problem. After resolving the problem, press this button to reset the breaker.

If the breaker gets activated even after correcting the connection, contact your Sony dealer.

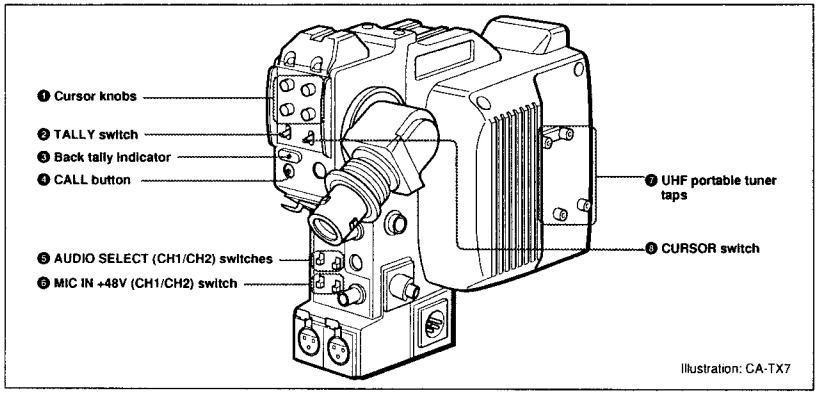
❽ POWER switch
Turns this unit's power supply on and off.
To power the unit, set the switch to EXT or CCU according to the type of power source being used.

EXT	Power supplied via an optional CMA-8A/8ACE AC Adaptor connected to the DC IN connector (when this unit is connected to a camera control unit via a coaxial cable)
CCU	Power supplied via camera control unit (when this unit is connected to a camera control unit via a triaxial cable)

Set this to OFF to turn off the power supply.
When this unit is connected to a camera control unit via a triaxial cable, the following functions continue to operate even after the power is turned off.
- Intercom communication
- On/off control of the back tally indicator (when TALLY switch is ON)
- Calling via CALL button

1) Return video: Video signals that are sent from a camera to a camera control unit and returned to the same or another camera so that the camera operators can check the recorded image.

Switches and Knobs on the Rear and Right Side


❶ Cursor knobs
❷ TALLY switch
❸ Back tally indicator
❹ CALL button
❺ AUDIO SELECT (CH1/CH2) switches
❻ MIC IN +48V (CH1/CH2) switch
❼ UHF portable tuner taps
❽ CURSOR switch
Illustration: CA-TX7

❶ Cursor knobs (for DXC-D30/D30P)
When the CURSOR switch ❽ is set to A or B, this adjusts the position and size of the box cursor that is displayed in the viewfinder of the DXC-D30/D30P.
H-POSITION: Adjusts the horizontal position of the box cursor.
V-POSITION: Adjusts the vertical position of the box cursor.
WIDTH: Adjusts the width of the box cursor.
HEIGHT: Adjusts the height of the box cursor.

❷ TALLY switch
Set this switch to the ON position to activate the back tally indicator ❸.

❸ Back tally indicator (red)
When the TALLY switch ❷ is in the ON position, this indicator lights (in red) in response to this unit's operating status. It also lights when the CALL button on the camera control unit or remote control panel has been pressed.

❹ CALL button
Press this button to call the operator of the camera control unit or remote control panel. Pressing this button lights the tally indicator (red) on the camera control unit, on the remote control panel, and in the camera's viewfinder. This unit's back tally indicator ❸ also lights if the TALLY switch ❷ is in the ON position.

❺ AUDIO SELECT (CH1/CH2) switches
Select the source for signals to be transferred via the camera control unit's channel 1 and channel 2.
CAMERA: Transfers audio from a microphone on the camera to the camera control unit.
CA-MIC: Transfers audio from a microphone connected to this unit's MIC IN (CH1/CH2) connector to the camera control unit.
CA-LINE: Transfers audio from a line output connected to this unit's MIC IN (CH1/CH2) connector to the camera control unit.

Location and Function of Parts

❺ MIC IN +48V (CH1/CH2) switch
Selects whether or not to supply power to a microphone connected via the MIC IN CH1 and CH2 connectors.
ON: Supplys +48-V power to microphone.
OFF: Do not supply power to microphone.
Leave this switch in the ON position when using a microphone of phantom powering[1] type.

❼ UHF portable tuner taps
When using an optional WRR-810A UHF Portable Tuner, attach the holder and bracket (supplied with the WRR-810A) for the portable tuner mounting adapter.

For details of attaching and using the WRR-810A, see the Operating Instructions for the WRR-810A.

❽ CURSOR switch (for DXC-D30/D30P)
Selects whether or not to display a box cursor in the DXC-D30/D30P Color Video Camera's viewfinder.
B: Displays box cursor B.
A: Displays box cursor A.
OFF: No box cursor is displayed.

Note
No cursor is displayed in the viewfinder when using a DXC-637 series camera.

1) Phantom powering: Powering method for operating condenser microphones by supplying power via a bias power source and an amplifier. Because no DC voltage is present in the audio channel, it is called "phantom powering".

Connectors on the Rear and Right Side

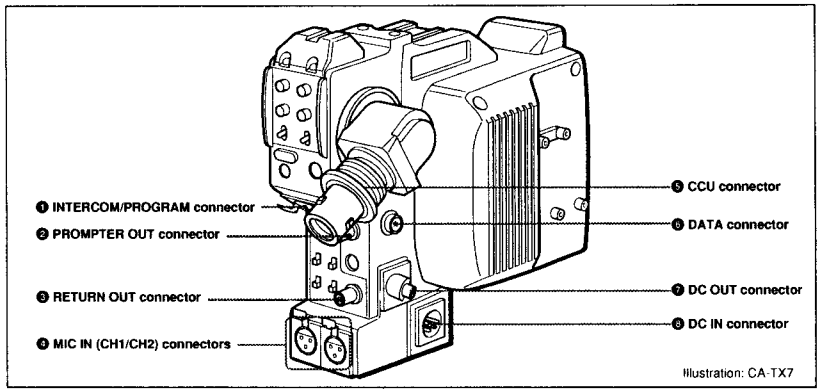


Illustration: CA-TX7

❶ INTERCOM/PROGRAM connector (XLR 5-pin, male)
Connect a headset for monitoring intercom audio or program audio. Normally, a monaural (one-side) headset should be connected.
An internal adjustment can be made to enable both sides of the headset to receive audio, with intercom audio on the left side and program audio on the right side.

Contact your Sony dealer for further information on this internal adjustment.

❷ PROMPTER OUT (teleprompter video signal output) connector (BNC type)
Outputs teleprompter video signals[1] from the camera control unit. (This unit can treat color teleprompter video signals.)
If you have made the internal adjustment to change the teleprompter video signal transfer direction so that signals are transferred from this unit to the camera control unit, this connector becomes the input connector for teleprompter video signals.

Contact your Sony dealer for further information on the internal adjustment to change the teleprompter video signal transfer direction.

❸ RETURN OUT (return video signal output) connector (BNC type)
Outputs return video signals from a camera control unit. Use the RETURN 1 and RETURN 2 buttons to switch between the two return video signals.

❹ MIC IN (CH1/CH2) (MIC inputs, channel 1 and channel 2) connectors (XLR 3-pin, female)
Connect external microphones or other equipment as sources for audio to be transferred to the camera control unit's channel 1 or 2.
Set the AUDIO SELECT (CH1/CH2) switch to select the channel for the connected equipment.

1) Teleprompter video signals: Video signals for prompter which displays scripts in the television monitor by the camera lens or on the face of a one-way mirror positioned directly in front of the camera lens so that performers can read scripts while looking into the camera lens.

Location and Function of Parts

❺ CCU (Camera control unit) connector (CA-TX7: Kings triaxial connector, CA-TX7P: Fischer triaxial connector)
Connect a camera control unit via a triaxial cable. In addition to supporting signal transmission between this unit and the connected camera control unit, the triaxial cable enables this unit to receive its power supply via the camera control unit.

Using a coaxial cable to connect the camera control unit
The CCU connector must be refitted to enable connection of a coaxial cable. Note that connecting a coaxial cable makes it impossible for this unit to receive power from the camera control unit. Use a CMA-8A/8ACE AC Adaptor for AC power sources.

Contact your Sony dealer for more information on refitting the CCU connector.

❻ DATA connector (10-pin)
Outputs control signals for the lens (focus or zoom control) and the tripod head (panning or tilting) that are sent from a remote control panel connected to the camera control unit.

For further information about using this connector, consult your Sony dealer.

❼ DC OUT connector (4-pin)
Use this connector when supplying power (DC 12V, Max. 12 W) to a WRR-801A UHF Portable Tuner (supplied separately) or an LCD teleprompter unit.

Note
Never connect a unit that has a power consumption rating of more than 12 W.

❽ DC IN connector (XLR 4-pin)
When connecting this unit to a camera control unit via a coaxial cable, use this connector for a CMA-8A/8ACE AC Adaptor (supplied separately). Use the CCQX-3 DC power cord to connect the CMA-8A/8ACE to this unit.

Mounting on Video Camera

This unit is dockable with the DXC-D30/D30P digital video camera or with a DXC-637 series analog video camera.
Replace the camera connector according to the camera to be used.
Using a DXC-D30/D30P : Use the PRO 76-pin DIGITAL connector.
Using a DXC-637 series camera : Use the PRO 50-pin connector.

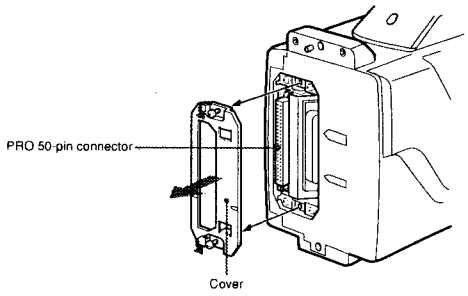
Note
Turn the POWER switch off before mounting the unit on the camera.

Using the DXC-D30/D30P

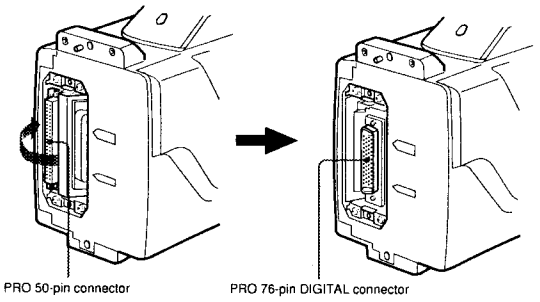
Replace the PRO 50-pin connector with the PRO 76-pin DIGITAL connector.

1 Loosen the two screws (M3) and remove the cover from the PRO 50-pin connector.

Note
Never loosen the other screws.



2 Press the right side of the PRO 50-pin connector until the PRO 76-pin DIGITAL connector appears.
The both connectors swing to switch the positions by pressing either of them.



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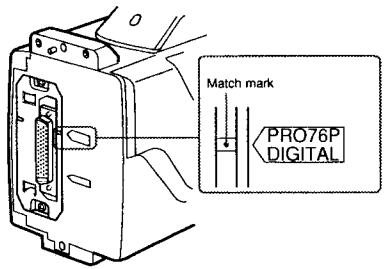
Mounting on Video Camera

3 Attach the cover upside down. Make sure that the match mark lines up with "PRO 76P DIGITAL" indication.



Using the DXC-637 series camera

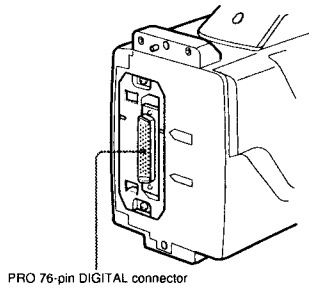
Replace the PRO 76-pin DIGITAL connector with the PRO 50-pin connector. Press the left side of the PRO 76-pin DIGITAL connector until the PRO 50-pin connector appears. Make sure that the match mark lines up with "PRO 50P" indication.

Mounting on the camera

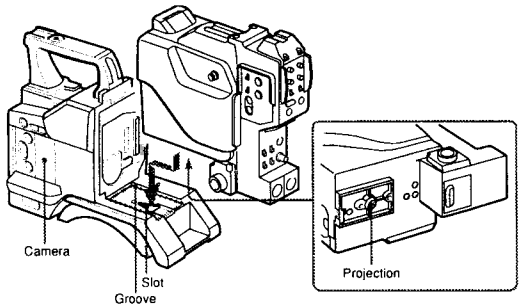
This section describes the procedure for mounting this unit on a DXC-D30/D30P. Use the same procedure for mounting on a DXC-637 series camera. (Replace the PRO 76-pin DIGITAL connector with the PRO 50-pin connector.)

1 If necessary, replace the PRO 50-pin connector with the PRO 76-pin DIGITAL connector.

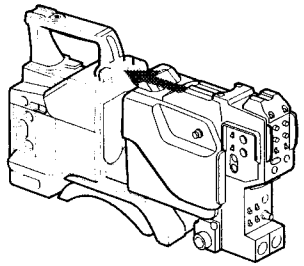
For details, see "Using the DXC-D30/D30P" (page 11).



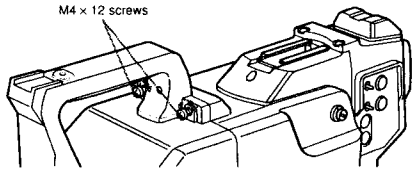
2 Fit the projection on the bottom of this unit into the slot on the camera.



3 Slide the unit along the groove on the camera, and press firmly until fixed.



4 Tighten the two screws (M4 × 12) in the figure.



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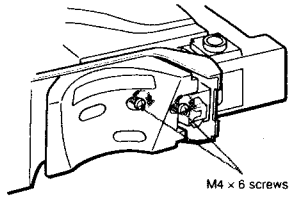
Mounting on Video Camera

5 Tighten the two screws (M4 × 6) to fix the shoulder pad.

Note

Slide the shoulder pad to its central position before tightening the screws. Otherwise the screws may not be properly fixed.



Removing from the camera

Follow the procedure above in reverse.

Notes on Use

Use and storage locations

Avoid using or storing the unit in the following places:

- Where it is subject to extremes of temperature (operating temperature: –10 °C to +45 °C (14 °F to 113 °F)).
  Note that in summer the temperature in a car with the windows closed can reach 50 °C (122 °F).
- Very damp or dusty places.
- Where rain is likely to reach the unit.
- Places subject to severe vibration.
- Near strong magnetic fields
- Near transmitting stations generating strong radio waves.

Avoid violent impacts

Dropping the unit, or otherwise imparting a violent shock to it, is likely to cause it to malfunction.

Do not cover with cloth

While the unit is in operation, do not cover it with a cloth or other material. This can cause the temperature to rise, leading to a malfunction.

After use

Turn the POWER switches on the unit and camera control unit off.

Care

If the body of the unit is dirty, wipe it with a dry cloth. For severe dirt, use a soft cloth steeped in a small amount of neutral detergent, then wipe dry. Do not use volatile solvents such as alcohol or thinners, as these may damage the finish.

Specifications

General

Power requirements
When supplied via the CCU connector: 120 V AC
When supplied via the DC IN connector: 12 V DC (10.5 to 17 V DC)

Power consumption
Varies according to connected equipment as shown in the following tables[1]:

When power is supplied via the CCU connector

	Power consumption	
	CA-TX7/TX7P	CA-TX7/TX7P and connected equipment
CA-TX7/TX7P	10.5 W	
CA-TX7/TX7P+DXC-D30/D30P	11 W	23.7 W
CA-TX7/TX7P+DXC-D30/D30P+DXF-701/701CE	11.2 W	26 W
CA-TX7/TX7P+DXC-D30/D30P+DXF-51/51CE	12.3 W	35 W
CA-TX7/TX7P outputting 12 W from the DC OUT connector+DXC-D30/D30P+DXF-51/51CE	13.3 W	48 W

When power is supplied via the DC IN connector

	Power consumption	
	CA-TX7/TX7P	CA-TX7/TX7P and connected equipment
CA-TX7/TX7P	7.5 W	
CA-TX7/TX7P+DXC-D30/D30P	7.5 W	20.2 W
CA-TX7/TX7P+DXC-D30/D30P+DXF-701/701CE	7.5 W	22.3 W
CA-TX7/TX7P+DXC-D30/D30P+DXF-51/51CE	7.5 W	30.2 W
CA-TX7/TX7P outputting 12 W from the DC OUT connector+DXC-D30/D30P+DXF-51/51CE	7.5 W	42.2 W

Operating temperature
–10°C to +45°C (14°F to 113°F)
Operating humidity
20% to 90%
Storage temperature
–20°C to +60°C (–4°F to 140°F)
Mass
Approx. 2.7 kg (5 lb 15 oz)
External dimensions
226 × 221 × 131 mm (9 × 8 3/4 × 5 1/4 inches)

1) The power consumption indicated on the name plate of the unit is total consumption of the CA-TX7/TX7P outputting 12 W from the DC OUT connector, DXC-D30/D30P, and DXF-51/51CE.

Specifications

Input/output connectors

CCU	CA-TX7: Kings triaxial connector (made by Lemo) CA-TX7P: Fischer triaxial connector
PROMPTER OUT	BNC, 1.0 V p-p, 75 Ω
RETURN OUT	BNC, 1.0 V p-p, 75 Ω
INTERCOM/PROGRAM	XLR 5-pin Input level: –60 dBs (dynamic) Output level: –∞ to +12 dBs
MIC IN 1,2	XLR 3-pin, female, 600 Ω, balanced Input level: –60 dB (for microphone input) or –20 dB (for line input)
DC IN	XLR 4-pin, 10.5 to 17 V DC
DC OUT	4-pin, 10.5 to 17 V DC, max. 12 W
DATA	10-pin Analog: 0 to 5 V DC × 4 Digital: 0 or 5 V DC × 2
Camera connector	PRO 76-pin DIGITAL or PRO 50-pin

Accessories supplied

Operating instructions (1)

Accessories not supplied

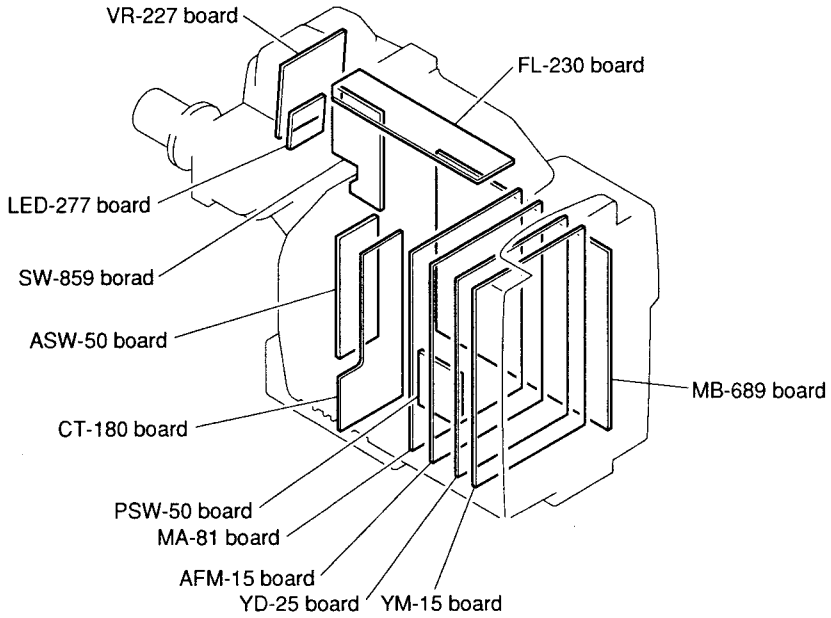
Triaxial cable (Belden)
CCQX-3 DC Power Cord
CMA-8A/8ACE AC Adaptor
WRR-810A UHF Portable Tuner

Design and specifications are subject to change without notice.

Sony Corporation Printed in Japan

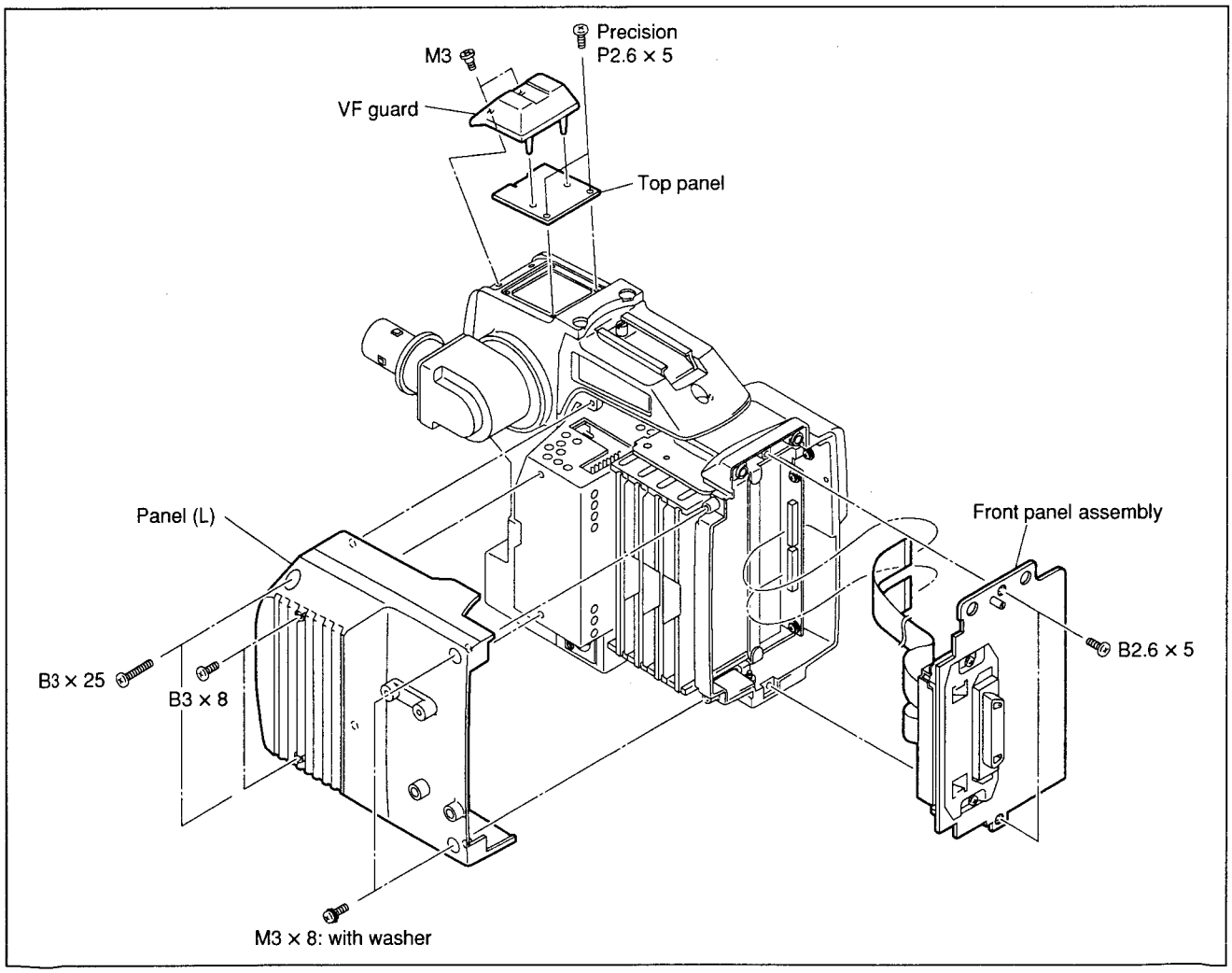
SECTION 2
SERVICE INFORMATION

2-1. BOARD LAYOUT



2-2. DISASSEMBLY/INSTALLATION OF MAIN PART

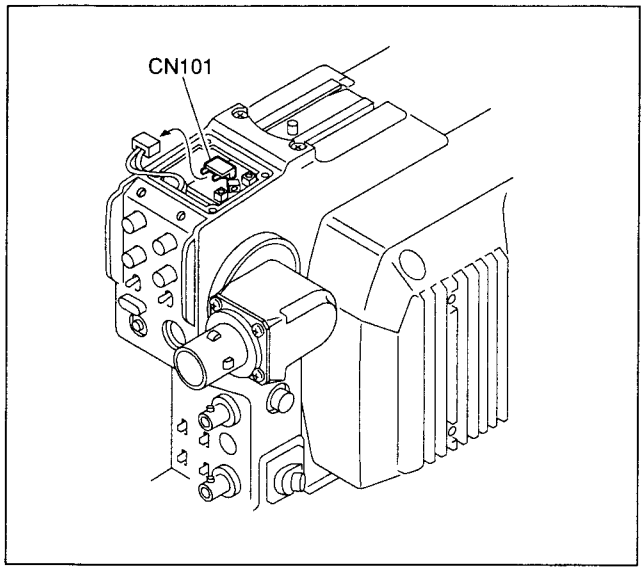
2-2-1. Removal of Cabinet



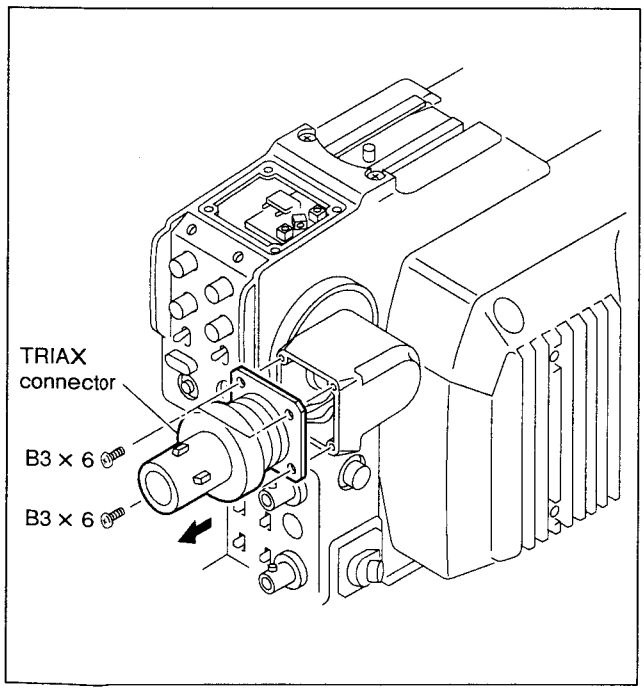
2-2-2. Installation of COAX connector

To connect between the CA-TX7/TX7P and CCU-TX7/TX7P with optional COAX connector and coaxial cable, instead of triaxial cable and TRIAX connector. Proceed as follows.

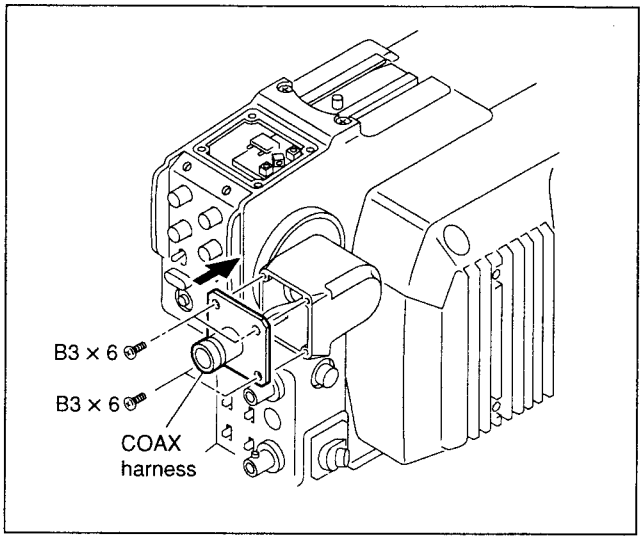
1. Remove the VF guard and the top panel. (Refer to "2-2-1. Removal of Cabinet".)
2. Disconnect CN101 on the FL-230 board.



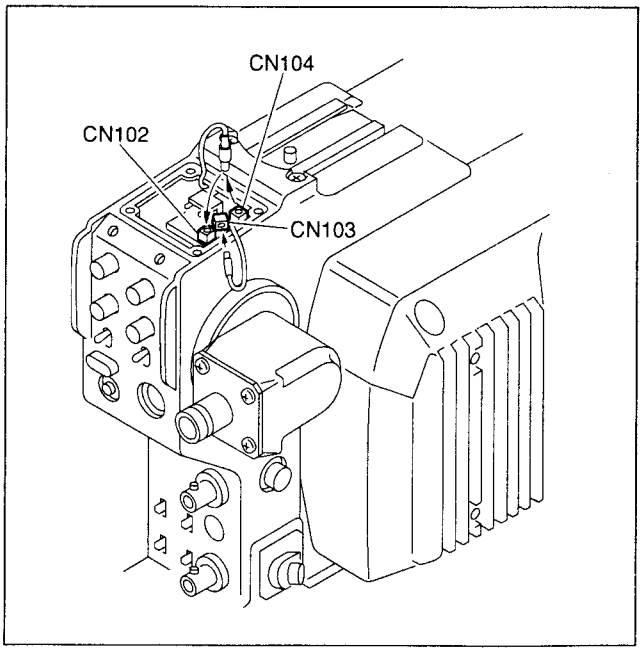
3. Remove four screws and carefully pull out the TRIAX connector.



4. Install the COAX harness to the connector box with the screws that were removed in Step 2.
   • COAX harness (Sony part No.: 1-955-388-11)



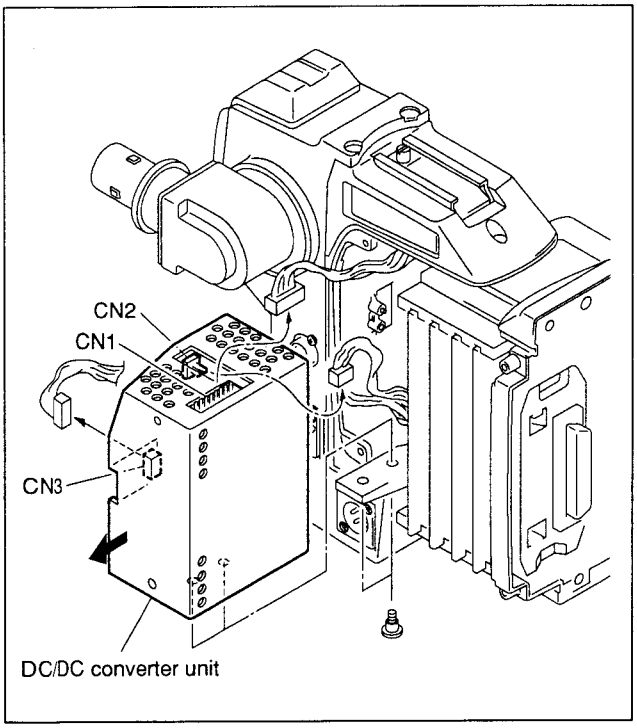
5. Connect the cable of COAX connector to CN103 on the FL-230 board. Disconnect the cable of MPX filter from CN104 on the FL-230 board and reconnect it to CN102.



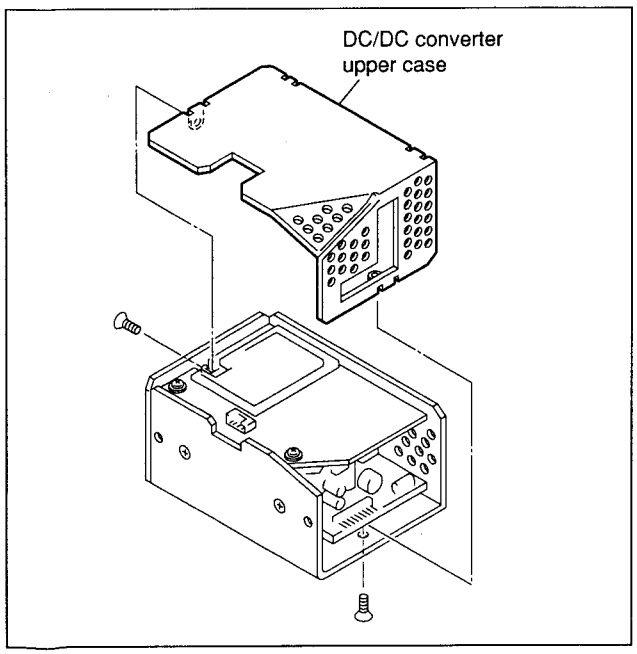
6. Reinstall the top panel and VF guard.

2-2-3. Replacement of DC/DC Converter

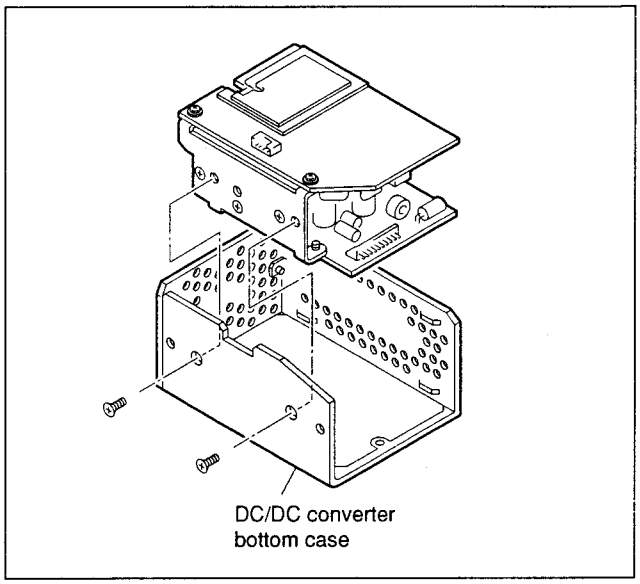
1. Remove the panel (L). (Refer to "2-2-1. Removal of Cabinet".)
2. Remove two screws and disconnect CN1, CN2 and CN3 from the DC/DC converter. Remove DC/DC converter unit.



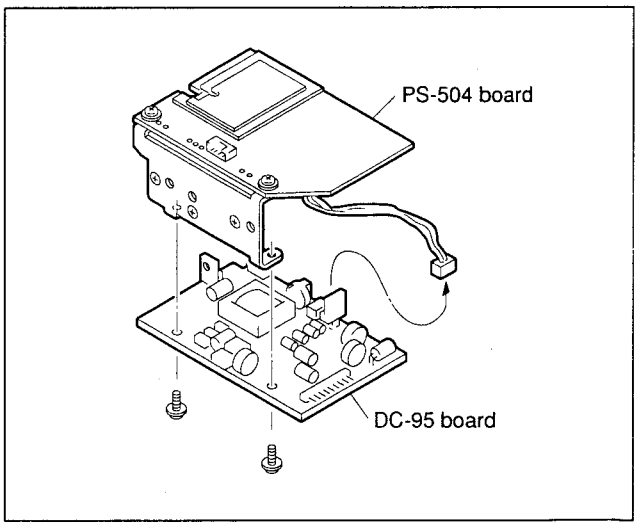
3. Remove two screws and remove the DC/DC converter upper case.



4. Remove two screws and remove the DC/DC converter bottom case.



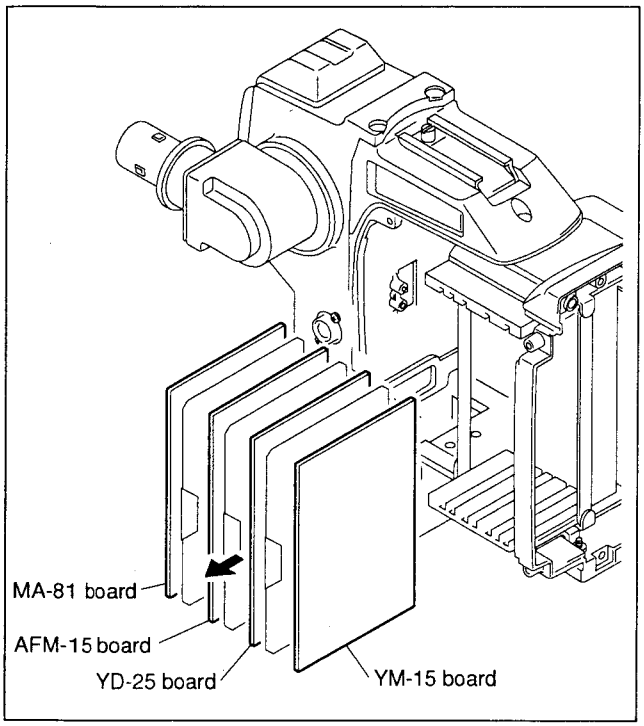
5. Remove two screws and disconnect the connector on the DC-95 board. Remove the DC-95 and PS-504 board.



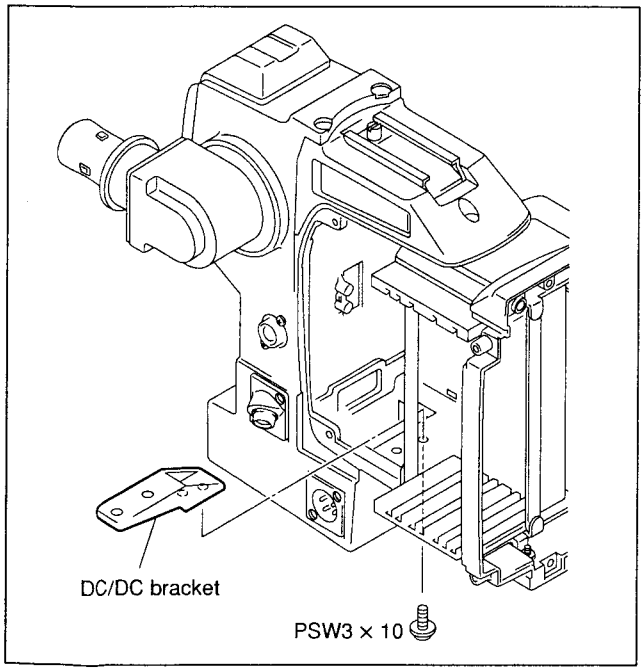
6. When installing a new board, reverse the above procedures.

2-2-4. Replacement of Multiplex (MPX) Filter

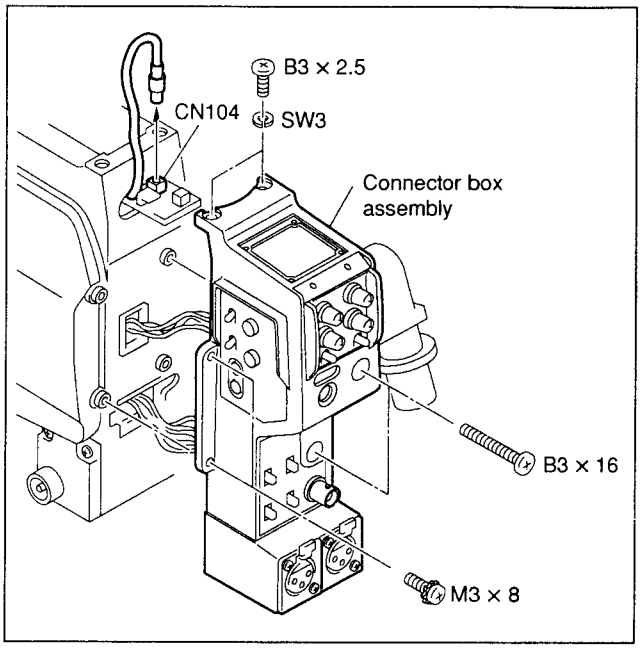
1. Remove the front panel assembly. (Refer to "2-2-1. Removal of Cabinet".)
2. Remove the DC/DC converter unit. (Refer to "2-2-3. Replacement of DC/DC Converter".)
3. Remove the shield board and remove the YM-15, YD-25, AFM-15 and MA-81 board.



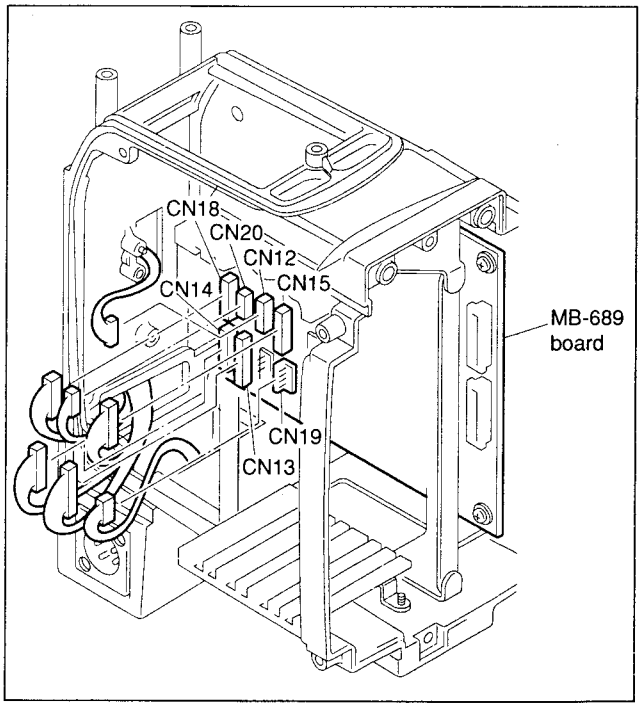
4. Remove screw and remove the DC/DC bracket.



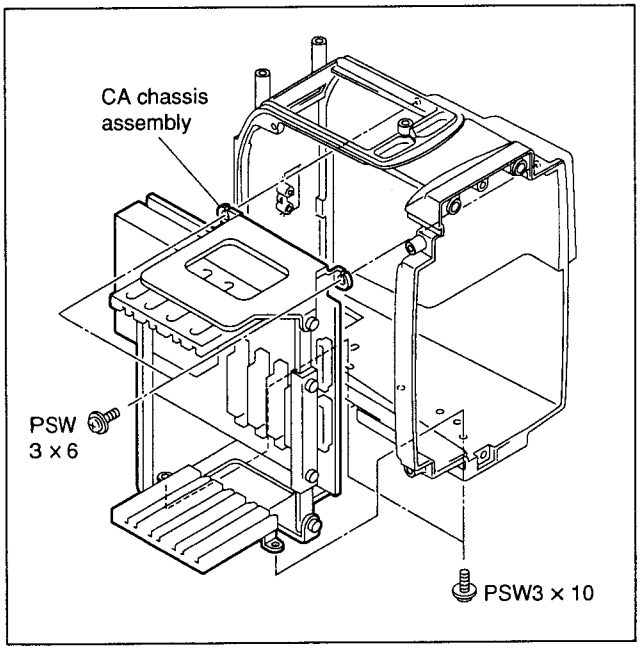
5. Remove six screws and remove the connector box assembly. Disconnect connector CN104 on the FL-230 board.



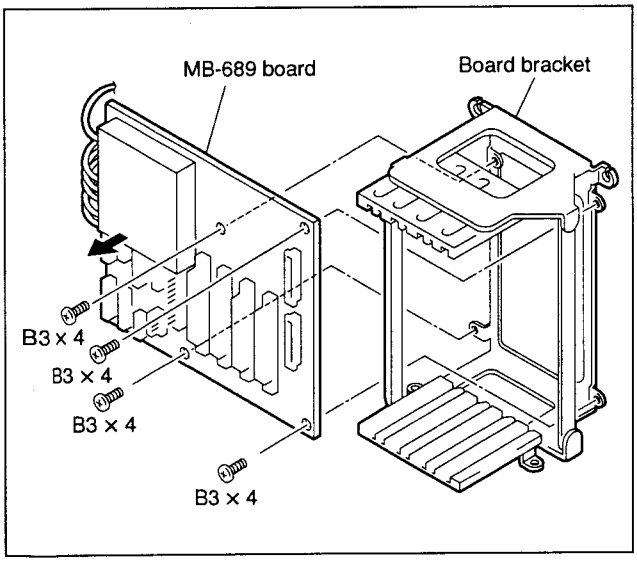
6. Disconnect seven connectors CN12, CN13, CN14, CN15, CN18, CN19 and CN20 on the MB-689 board.



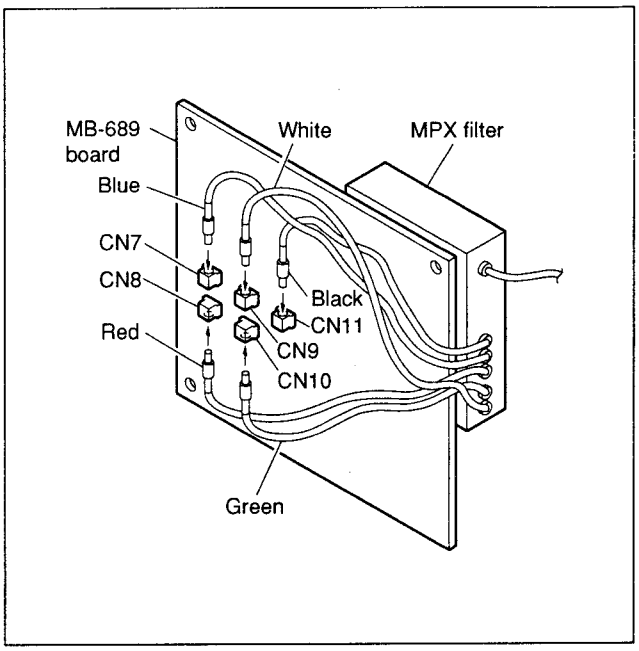
7. Remove four screws and remove the CA chassis assembly.



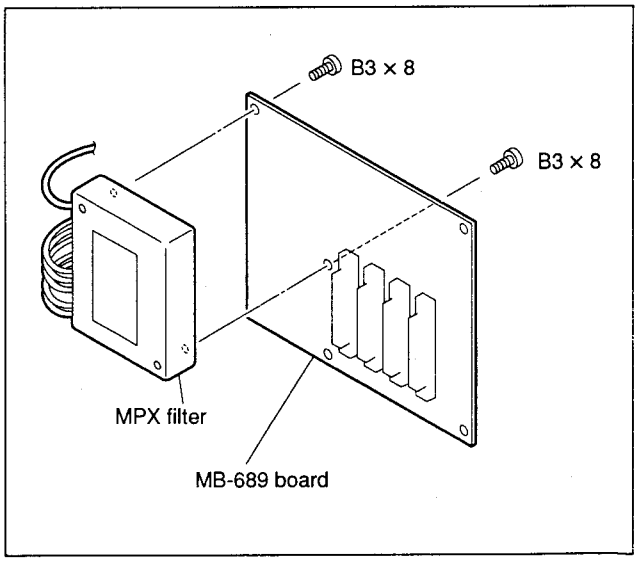
8. Remove four screws and remove the MB-689 board.



9. Disconnect five connectors CN7, CN8, CN9, CN10 and CN11 on the MB-689 board.



10. Remove two screws and remove the MPX filter.



11. When installing a new MPX filter, reverse the above procedures.

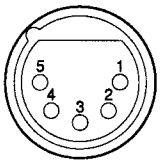
2-3. CONNECTOR AND CABLE

2-3-1. Connector Input/Output Signals

The connector input/output signals are described below.

- PROMPTER OUT (BNC): 75 Ω 1.0 Vp-p
- RETURN OUT (BNC): 75 Ω 1.0 Vp-p
- CCU (KING: for CA-TX7)
- CCU (Fisher: for CA-TX7P)

- INTERCOM/PGM (XLR 5P FEMALE)

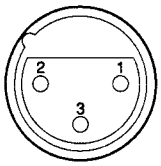


(EXTERNAL VIEW)

(0 dBu=0.775 Vrms)

No.	Signal	Specifications
1	INCOM MIC (G) IN	−60 dBu
2	INCOM MIC (X) IN	(DYNAMIC MIC only)
3	GND	GND for HEADPHONE
4	INCOM OUT	−0 dBu (max. 12 dBu)
5	PGM AUDIO OUT	

- MIC IN CH1/CH2 (XLR 3P FEMALE)

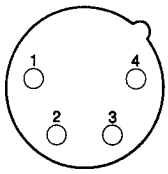


(EXTERNAL VIEW)

(0 dBu=0.775 Vrms)

No.	Signal	Specifications
1	MIC IN (G)	GND for MIC
2	MIC IN (X)	60 dBu, Zi ≦ 600 Ω, BALANCED
3	MIC IN (Y)	(Phantom: 48 V ± 4 V)

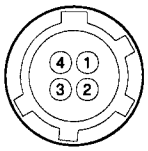
- DC IN (XLR 4P MALE)



(EXTERNAL VIEW)

No.	Signal	Specifications
1	GND	GND for DC (+)
2	(SPARE)	No connection
3	(SPARE)	No connection
4	DC (+) IN	DC 10.5 V to 17 V

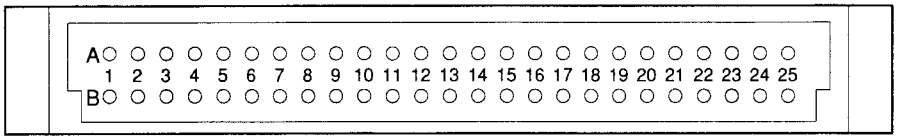
- DC OUT (4P MALE)



(EXTERNAL VIEW)

No.	Signal	Specifications
1	GND	GND for UNREG
2	(SPARE)	No connection
3	(SPARE)	No connection
4	UNREG +12 V OUT	+12 Vdc 1 A

• CAMERA (50P FEMALE)



(EXTERNAL VIEW)

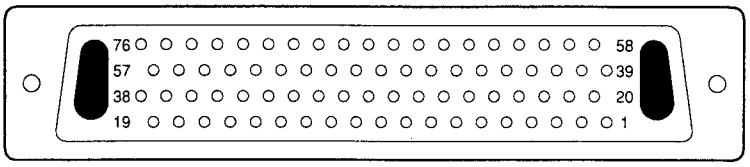
Pin No.	Signal	Specification
A1	MODE ID OUT	OPEN: COMP, GND: R/G/B
B1	GND (CHASSIS)	
A2	MIC (Y) IN	−60 dBm
B2	MIC (X) IN	
A3	MIC (G) IN	
B3	EAR (G) OUT	
A4	REC TALLY IND OUT	Zi ≧ 600 Ω
B4	EAR (X) OUT	−6 dBu
A5	VTR TRIG IN	
B5	REC RESET OUT	
A6	S.D (V/C) OUT	H: 5 V
B6	S.D (C/V) IN	L: 0 ± 0.5 V
A7	SCL VTR OUT	Zi ≧ 47 kΩ
B7	CS VTR OUT	Zo ≦ 1 kΩ
A8	GENLOCK VIDEO (G) OUT	VBS: 1.0 Vp-p
B8	GENLOCK VIDEO (X) OUT	Zi ≧ 1 kΩ
A9	SYNC (G) IN	H: 4.0 to 5.5 Vp-p : NEGATIVE
B9	SYNC (X) IN	L: 0 ± 0.4 Vdc Zo ≦ 2 kΩ
A10	PB RET VIDEO (G) OUT	1.0 Vp-p
B10	PB RET VIDEO (X) OUT	Zi ≧ 10 kΩ
A11	CF/V RESET I/O	H: 4.0 to 5.5 Vp-p, Zo ≦ 2 kΩ L: 0 ± 0.4 Vdc
B11	VF VIDEO CONT OUT	CAM: OPEN Zi ≧ 1 kΩ, PB: 0 V
A12	VBS (CA) (G) IN	1.0 Vp-p, SYNC NEGATIVE
B12	VBS (CA) (X) IN	Zo=75 Ω ± 5%
A13	STBY/$\overline{\text{SAVE}}$ IN	STBY: 4.0 to 5.5 Vp-p Zo ≦ 100 Ω SAVE: 0 ± 0.25 V
B13	$\overline{\text{VTR}}$/CCU CONT IN	VTR: 0 ± 0.25 V, Zo ≦ 1 kΩ CCU: 5.0 ± 0.5 V
A14	CHROMA (G) IN	NTSC: 0.286 Vp-p ± 10%
B14	CHROMA (X) IN	PAL: 0.300 Vp-p ± 10% Zo ≦ 75 Ω ± 5%

Pin No.	Signal	Specification	
A15	Y (G) IN	1.0 Vp-p, SYNC NEGATIVE	
B15	Y (X) IN	Zo ≦ 75 Ω ± 5%	
A16	COMP (CA) GND	R/G/B	
B16	R/R-Y (CA) IN	1.4 Vp-p, POSITIVE	
A17	G/Y (CA) IN	Zo ≦ 75 Ω ± 5%	
B17	B/B-Y (CA) IN	COMPONENT OUT	*1
A18	BATT ALARM/S. DATA		
B18	REC REVIEW CONT IN	GND: REC REVIEW	
A19	(SPARE)		
B19	(SPARE)		
A20	+8.5 V IN 9.0 V	8.3 V to 9.1 V	
B20	+5 V IN	±0.1 V	
A21	−5 V IN		
B21	AGND	REG, GND	
A22	POWER +12 V DC OUT	10.6 V to 17.0 Vdc	
B22	POWER +12 V DC OUT		
A23	POWER +12 V DC GND	GND for ± 12 Vdc	
B23	POWER +12 V DC GND		
A24	(SPARE)		
B24	(SPARE)		
A25	GND (CHASSIS)	CHASSIS GND	
B25	GND (CHASSIS)		

*1

	UC	CE
Y	0.714 Vp-p	0.700 Vp-p
R-Y	0.700 Vp-p	0.525 Vp-p
B-Y	0.700 Vp-p	0.525 Vp-p

• CAMERA/CA (76P FEMALE)



(EXTERNAL VIEW)

Pin No.	Signal	Specification
1	REC TALLY OUT	Zi ≧ 600 Ω
2	S.D. (V/D) OUT	H: 5 V L: 0 ± 0.5 V
3	SCL VTR OUT	Zi ≧ 47 kΩ Zo ≦ 1 kΩ
4	GENLOCK (G) OUT	VBS: 1.0 Vp-p Zi ≧ 1 kΩ
5	SYNC (G) OUT	H: 4.0 to 5.5 Vp-p : NEGATIVE L: 0 ± 0.4 Vdc Zo ≦ 2 kΩ
6	PB (G) OUT	1.0 Vp-p Zi ≧ 10 kΩ
7	PB (Y) (X) OUT	1.0 Vp-p, NEGATIVE, Zi ≧ 1 kΩ
8	VBS (CA) (G) IN	1.0 Vp-p, SYNC NEGATIVE Zo=75 Ω ± 5%
9	$\overline{\text{VTR}}$/CCU IN	VTR: 0 ± 0.25 V, Zo ≦ 1 kΩ CCU: 5.0 ± 0.5 V
10	C (X) IN	NTSC: 0.286 Vp-p ± 10% PAL: 0.300 Vp-p ± 10% Zo ≦ 75 Ω ± 5%
11	Y (X) OUT	1.0 Vp-p, SYNC NEGATIVE Zo ≦ 75 Ω ± 5%
12	R/R-Y (CA) IN	R/G/B 1.4 Vp-p, POSITIVE
13	B/B-Y (CA) IN	Zo ≦ 75 Ω ± 5% COMPONENT IN *1
14	SKIN GATE IN	Gate area (H: 4 to 5.5 Vdc) Non gate area (L: 0 ± 0.2 Vdc)
15	+5.0 V IN	±0.1 V
16	AGND	REG, GND
17	EXT DC OUT	10.6 V to 17.0 Vdc
18	EXT DC GND	GND for ±12 Vdc
19	DCLK (X) IN	
20	VTR TRIG IN	
21	S.D. (C/V) IN	H: 5 V L: 0 ± 0.5 V
22	CS VTR OUT	Zi ≧ 47 kΩ Zo ≦ 1 kΩ
23	GENLOCK (X) OUT	Zi ≧ 1 kΩ

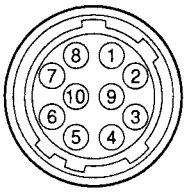
Pin No.	Signal	Specification
24	SYNC (X) OUT	H: 4.0 to 5.5 Vp-p : NEGATIVE L: 0 ± 0.4 Vdc Zo ≦ 2 kΩ
25	PB (VBS) (X) OUT	Zi ≧ 10 kΩ
26	CF/V RESET I/O	H: 4.0 to 5.5 Vp-p, Zo ≦ 2 kΩ L: 0 ± 0.4 Vdc
27	VBS (CA) (X) IN	1.0 Vp-p, SYNC NEGATIVE Zo=75 Ω ± 5%
28	C (G) IN	NTSC: 0.286 Vp-p ± 10% PAL: 0.300 Vp-p ± 10% Zo ≦ 75 Ω ± 5%
29	Y (G) IN	1.0 Vp-p, SYNC NEGATIVE Zo ≦ 75 Ω ± 5%
30	COMP GND	R/G/B 1.4 Vp-p, POSITIVE
31	G/Y (CA) IN	Zo ≦ 75 Ω ± 5% COMPONENT OUT *1
32	BATT S.DATA OUT	
33	+9.0 V IN	8.3 V to 9.1 V
34	−5.0 V IN	±0.1 V
35	EXT DC OUT	10.6 V to 17.0 Vdc
36	EXT DC GND	GND for ±12 Vdc
37	DCF IN	
38	DCLK GND	
39	MODE ID OUT	
40	MIC1 (G) IN	OPEN: COMP, GND: R/G/B
41	AUDIO LEV IN	H: 4 to 5.5 Vdc L: 0 ± 0.2 Vdc, 1 kΩ
42	(SPARE)	
43	DIGI/ANA OUT	H: Analog L: Digital
44	(SPARE)	
45	(SPARE)	
46	(SPARE)	
47	(SPARE)	
48	(SPARE)	
49	(SPARE)	
50	(SPARE)	

Pin No.	Signal	Specification
51	(SPARE)	
52	DCLK GND	H: 3 ± 0.2 Vdc
53	BYRY (0) IN	L: 0 ± 0.2 Vdc
54	BYRY (2) IN	
55	BYRY (4) IN	
56	BYRY (6) IN	
57	BYRY (8) IN	
58	MIC1 (X) IN	–20 dBm, Zo ≦ 100 Ω
59	MIC1 (Y) IN	
60	(SPARE)	
61	(SPARE)	
62	76P ID	
63	(SPARE)	
64	(SPARE)	
65	(SPARE)	
66	(SPARE)	
67	(SPARE)	
68	(SPARE)	
69	(SPARE)	
70	(SPARE)	
71	(SPARE)	
72	BYRY (1) IN	H: 3 ± 0.2 Vdc
73	BYRY (3) IN	L: 0 ± 0.2 Vdc
74	BYRY (5) IN	
75	BYRY (7) IN	
76	BYRY (9) IN	

*1

	UC	CE
Y	0.714 Vp-p	0.700 Vp-p
R-Y	0.756 Vp-p	0.525 Vp-p
B-Y	0.756 Vp-p	0.525 Vp-p

• DATA (10P FEMALE)



(EXTERNAL VIEW)

No.	Signal	Specification
1	FOCUS CONT OUT	0 V to 5 V
2	ZOOM CONT OUT	
3	PAN CONT OUT	
4	TILT CONT OUT	
5	(SPARE)	
6	ON/OFF CONT OUT1	0 V/5 V
7	ON/OFF CONT OUT1	
8	(SPARE)	
9	GND	
10	(SPARE)	

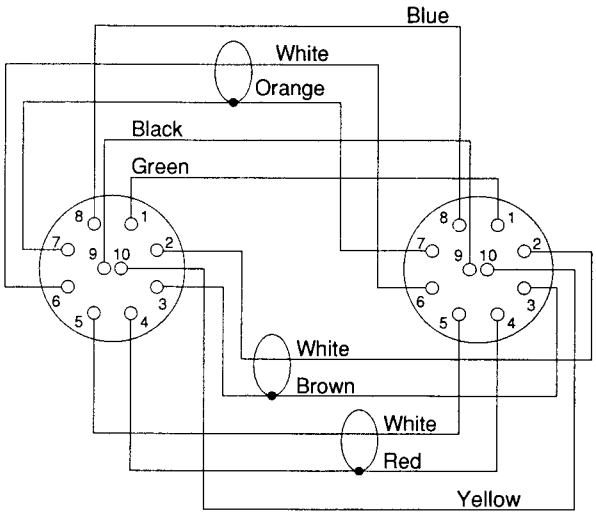
2-3-2. Connection Connector

Connection made with the connector panels during installation or service, should be made with the connectors/ complete cable assemblies specified in the following list, or equivalent parts.

Connector name	Connection connectors/cables
GENLOCK/PROMPT RET OUT (BNC)	1-560-069-11 Plug, BNC or B-B Cable assembly (cable length 1.5 m, option)
INCOM/PMG (5P FEMALE)	1-508-370-11 XLR, 5P Male or CANNON XLR-5-12C equivalent
MIC IN (3P FEMALE)	1-508-084-00 XLR, 3P Male or CANNON XLR-3-12C equivalent
DC IN (4P MALE)	1-508-362-00 XLR, 4P Female or CANNON XLR-4-11C equivalent or Cable assembly (supplied with AC-550) 1-551-577-00 Cable with XLR plugs
DC OUT	1-566-425-11 Plug, 4P Male or HIROSE HR10A-7P-4P equivalent
DATA (10P FEMALE)	1-506-522-11 Plug, 10P Male or CCA Cable assembly CCA-7-5 (supplied with RCP-TX7) (50 m max.)

2-3-3. Wiring Diagram for Cable

• CCA-7 Cable



2-4. SWITCH FUNCTIONS ON BOARD

MA-81 board

S1 : STEREO/MONO switch

When hearing an INCOM signal and PROGRAM signal individually with stereo headset, set this switch to STEREO position.

When hearing an INCOM signal and PROGRAM signal with monaural headset, set this switch to MONO position.

Factory setting : MONO

Note : When using switch S1, be sure to set switches S3 and S4 as follows

S1	STEREO	MONO
S3	OFF	ON
S4	OFF	ON

S2-1 : SIDE TONE ON/OFF switch

Set this switch to ON position when mixing the side tone signal.

Side tone signal level can be controlled by RV3.

Factory setting : ON

S2-2 : Level control mode select switch

ON : Both intercom and program audio levels can be adjusted by INCOM level control.
Mixing ratio of an intercom and program audio levels can be adjusted by PGM level control.

OFF : Normal position. Intercom audio level can be adjusted by INCOM level level control.
Program audio level can be adjusted by PGM level control.

Factory setting : OFF

S2-3 : Not in use

Factory setting : OFF

S2-4 : Not in use

Factory setting : OFF

S3 : INCOM MIX switch

Set this switch to ON position when mixing an intercom audio signal with program audio signal.

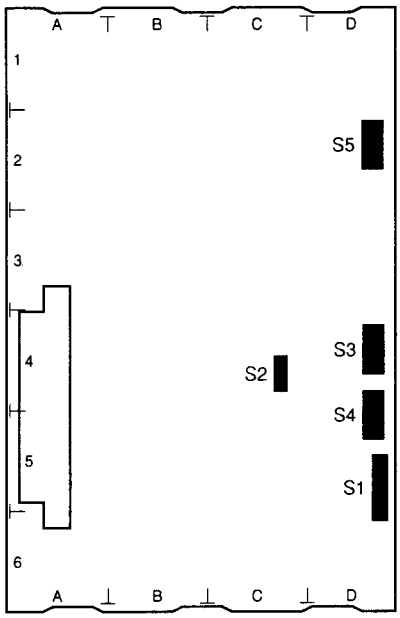
Factory setting : ON

S4 : PGM MIX switch

Set this switch to ON position when mixing a program audio signal with intercom audio signal.

Factory setting : ON

MA-81 board



S5 : MIC MIX TO PGM switch

Use this switch for checking the signal from the microphone.

- MIC1 : Mixed signal of a MIC1 audio and program audio can be heard through headset.
- MIC2 : Mixed signal of a MIC2 audio and program audio can be heard through headset.

Factory setting : OFF

YD-25 board

S1 and S6 : PROMPTER/AUX switches

- PROMPTER : Set this position when sending a prompter video signal from the CCU-TX7/TX7P to CA-TX7/TX7P.
- AUX : Set this position when sending an auxiliary video signal from the CA-TX7/TX7P to CCU-TX7/TX7P.

(In case of AUX position, input the video signal to the PROMPTER terminal of CA-TX7/TX7P and output the signal from the PROMPTER terminal of CCU-TX7/TX7P.)
Factory setting : PROMPTER

Note : When using S1 and S6 switches, change as follows.

- In case of using the PROMPTER mode:

1) Set S1 and S6 switches to "PROMPTER" side on the YD-25 board.
2) Disconnect CN8 and connect CN3 and CN7 on the CT-181 board of CCU-TX7/TX7P.
3) Set S2002 switch to TX side on the CT-181 board of CCU-TX7/TX7P.

- In case of using the AUX mode:

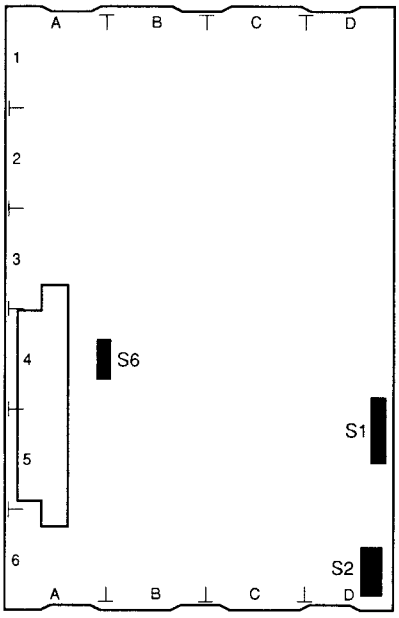
1) Set S1 and S6 switches to "AUX" side on the YD-25 board.
2) Disconnect CN7 and connect CN3 and CN8 on the CT-181 board of CCU-TX7/TX7P.
3) Set S2002 switch to RX side on the CT-181 board of CCU-TX7/TX7P.

S2 : RET/VBS switch

- RET : A return video signal is output from the RETURN terminal of CA-TX7/TX7P.
- VBS : A camera signal (VBS) is output from the RETURN terminal of CA-TX7/TX7P.

Factory setting : RET

YD-25 board



2-5. CIRCUIT DESCRIPTION

The CA-TX7/TX7P mainly consists of the following boards.

YM-15 board

The YM-15 board modulates the luminance signal Y, the color difference signals R-Y and B-Y. And it selects a signal to be input/output at GENLOCK IN/PROMPT OUT connecter. And also it quadrature-modulates the Y signal and SKIN GATE signals with the carrier of 22.5 MHz and the R-Y and B-Y signals with the carrier of 45 MHz. The resultant signals is sent to the CCU.

MA-81 board

The MA-81 board performs the process of audio signal such as the INCOM mode switching and gain control. As for how to select the INCOM mode, refer to Section 2-4. "Function of Switch on Board" --- MA-81 board.

AFM-15 board

The AFM-15 board modulates/demodulates the audio signals such as the MIC, INCOM and PGM. It also demodulates the H CONT signal and modulates/ demodulates the CHU/CCU DATA. And it also generates the TONE signal, piggybacks it on to the CHU DATA and they modulates the resultant signal.

YD-25 board

The YD-25 board demodulates the RET VIDEO signal and PROMPTER signal and also, it has the modulation circuit of AUX video signal for the option. When changing the PROMPTER to the AUX, set the S1 and S6 switches to the AUX on the YD-25 board.

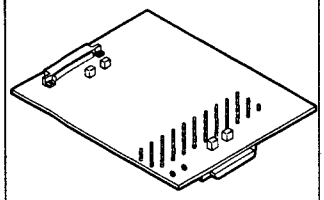
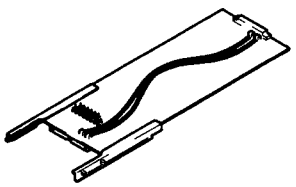
Communication with CCU

The communication signal between the CCU and the CA is modulated/demodulated on the AFM-15 board by the microcomputer on the CT-180 board. The microcomputer on the CT-180 board communicates with the camera, and the commands of RCP-TX or COU-TX7 is sent to camera via the CCU and CA.

SECTION 3
ALIGNMENT

3-1. PREPARATIONS

3-1-1. Equipment Required

Extension board EX-565 (For CA-TX7/TX7P)	Extension board EX-564 (For CCU-TX7/TX7P)
Sony Part No: J-6276-430-A	Sony Part No: J-6276-420-A
	

Measuring Equipment

- Variable dc power supply
- Frequency counter
- Spectrum analyzer
- Distortion meter
- Audio generator
- Oscilloscope
  Tektronix 2465 or equivalent
- Waveform monitor/Vectorscope
  Tektronix 1765 or equivalent
- Digital voltmeter
- Video signal generator
  Tektronix 1410 or equivalent (For NTSC)
  Tektronix 1411 or equivalent (For PAL)
  (Sweep signal, 10 STEP signal)
- Color monitor
  Sony PVM-1354Q or equivalent (For NTSC)
  Sony PVM-1454QM or equivalent (For PAL)

Peripheral Equipment

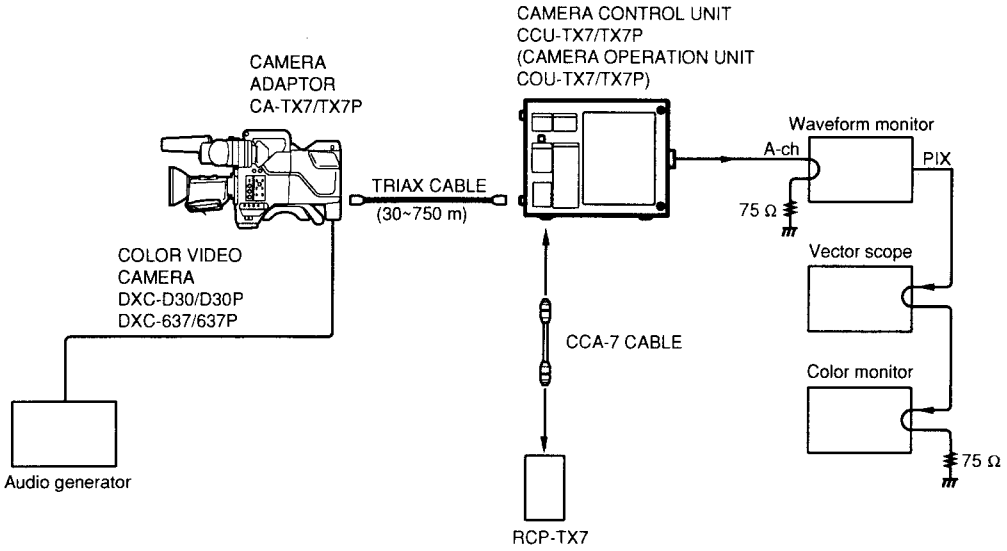
- Color video camera — Sony DXC-D30 (For NTSC)
  Sony DXC-D30P (For PAL)
  Sony DXC-637 (For NTSC)
  Sony DXC-637P (For PAL)
- Camera control unit — Sony CCU-TX7 (For NTSC)
  Sony CCU-TX7P (For PAL)
- Camera operation unit — Sony COU-TX7
  or
  Remote control panel — Sony RCP-TX7
- TRIAX cable (50m~150m, 300m, 750m)

3-1-2. Notes on Adjustment

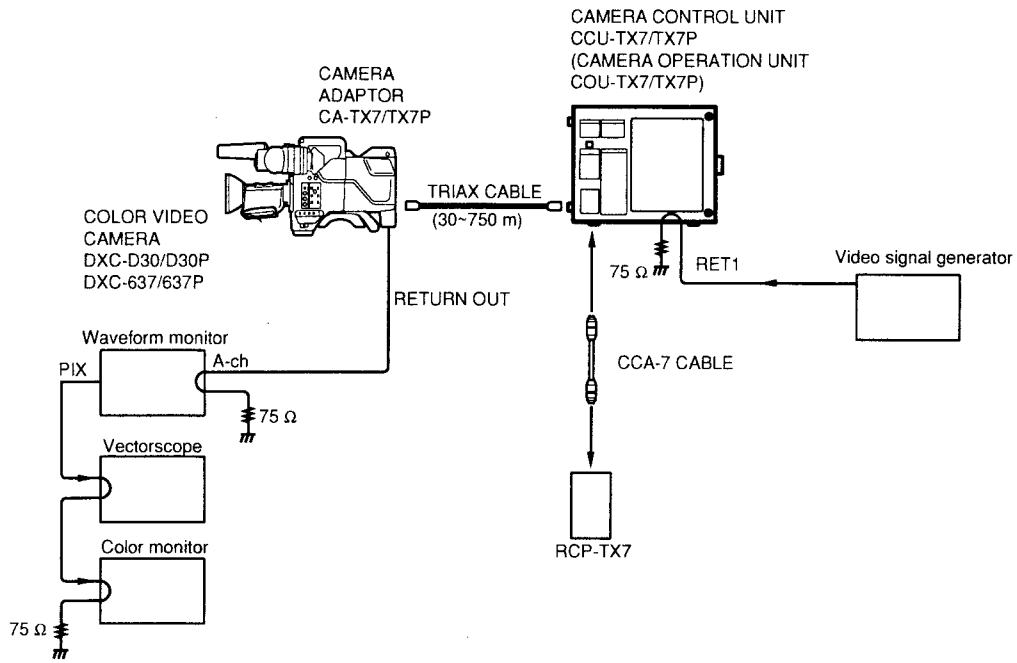
- Calibration of all measuring equipment should be completed.
- Alignment of CCU-TX7/TX7P should be completed.
- Perform connection of all equipment (refer to section "3-1-3").
- Perform the "Initial Setting" (refer to section "3-1-4").
- Be sure to close the lens of the color video camera.
- Turn off the power when extracting the board.
- Warm up the unit about 10 minutes before performing adjustment.
- Be sure to use a non-inductive screwdriver for adjusting ⊘LV, ⊘FL, or ⊘T.

3-1-3. Connections

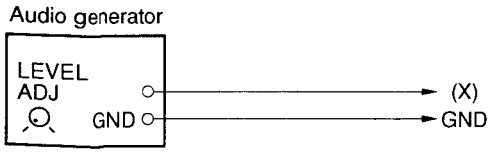
General connection



Connection for adjusting the YD-25 board (Exclude from 3-5-7. TX PROMPT VIDEO Demodulation Adjustment)



Connection for audio system adjustment



3-1-4. Initial Setting

CA-TX7/TX7P

Note

When switching the following switches from a customer set position, it is recommended to record the setting state in the table below.

Board	Switch	Initial setting
MA-81	S1	MONO
	S2-1	ON
	S2-2	OFF
	S2-3	OFF
	S2-4	OFF
	S3	ON
	S4	ON
	S5	OFF
YD-25	S1	PROMPTER
	S6	PROMPTER
	S2	RET

Operation Panel

- When using the RCP-TX7
  CAM POWER → ON (lights)
  BARS button → ON (lights)

- When using the COU-TX7
  OUTPUT switch → BARS

3-2. MA-81 BOARD ADJUSTMENT

Since ⊘RV3 is used for adjusting the side-tone level, adjust the sound level to your liking while talking. Set switch S2-1 on the MA-81 board to ON when outputting the side-tone signal.

S2-1/MA-81 board → ON

3-3. AFM-15 BOARD ADJUSTMENT

Warm up the unit sufficiently (about 10 to 30 minutes) before performing the adjustment.

3-3-1. MIC 1 RF Adjustment

Note

- Be sure to use a non-inductive screwdriver for adjusting ⊘LV.

Equipment : Frequency counter
Test Point : TP2 (GND: E1)/AFM-15 board
Adjustment Point : ⊘LV2 (6.2 MHz)/AFM-15 board
Specification : 6,200 ± 5 kHz

3-3-2. MIC 2 RF Adjustment

Note

- Be sure to use a non-inductive screwdriver for adjusting ⊘LV.

Equipment : Frequency counter
Test Point : TP4 (GND: E1)/AFM-15 board
Adjustment Point : ⊘LV3 (6.7 MHz)/AFM-15 board
Specification : 6,700 ± 5 kHz

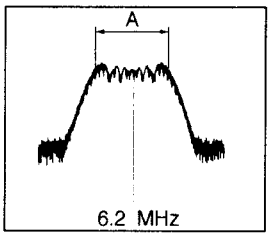
3-3-3. MIC 1 Deviation Adjustment

Equipment : Spectrum analyzer, Audio generator, Oscilloscope
To be extended : AFM-15 board

Preparations:

- CA-TX7/TX7P: AUDIO SELECT (Panel)
  CH-1: CAMERA/CA-MIC/CA-LINE switch → CA-LINE
- Input a 400 Hz sine-wave signal from the audio generator to CH-1 MIC IN connector of the CA-TX7/TX7P. (See "Connection for audio system adjustment" in section 3-1-3.)
- Adjust the output level of audio generator so that the level at TP19 (GND: TP12) on the extension board is 220 mVp-p (−20 dBu).

Test Point : TP2 (GND: E1)/AFM-15 board
Adjustment Point : ⊘RV2 (MIC1 DEV)/AFM-15 board
Specification : A=16.0 ± 0.8 kHz



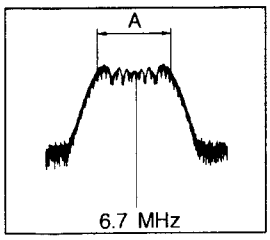
Center frequency : 6.2 MHz
SPAN : 50 kHz
RBW : 1 kHz

3-3-4. MIC 2 Deviation Adjustment

Equipment : Spectrum analyzer,
Audio generator
To be extended : AFM-15 board

Preparations:
- CA-TX7/TX7P: AUDIO SELECT (Side panel)
  CH-2: CAMERA/CA-MIC/CA-LINE switch → CA-LINE
- Input a 450 Hz sine-wave signal from the audio generator to CH-2 MIC IN connector of the CA-TX7/TX7P.
  (See "Connection for audio system adjustment" in section 3-1-3.)
- Adjust the output level of audio generator so that the level at TP17 (GND: TP12) on the extension board is 220 mVp-p (−20 dBu).

Test Point : TP4 (GND: E1)/AFM-15 board
Adjustment Point : ⊘RV3 (MIC2 DEV)/AFM-15 board
Specification : A=18.0 ± 0.8 kHz

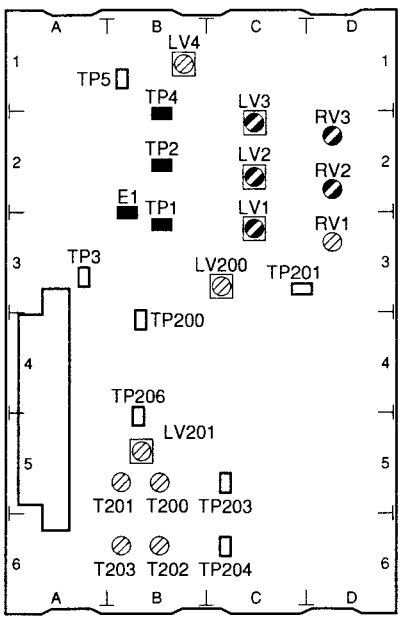


Center frequency : 6.7 MHz
SPAN : 50 kHz
RBW : 1 kHz

3-3-5. INCOM RF Adjustment

Note
- Be sure to use a non-inductive screwdriver for adjusting ⊘LV.

Equipment : Frequency counter
Test Point : TP1 (GND: E1)/AFM-15 board
Adjustment Point : ⊘LV1 (7.1 MHz)/AFM-15 board
Specification : 7,100 ± 5 kHz



AFM-15 BOARD (A SIDE)

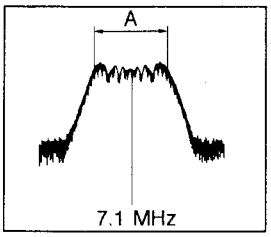
3-3-6. INCOM Deviation Adjustment

Equipment : Spectrum analyzer,
Audio generator
To be extended : AFM-15 board

Preparations:

- Input a 400 Hz sine-wave signal from the audio generator to pin 2 and pin 1 (GND) of INTERCOM/PROGRAM connector of the CA-TX7/TX7P. (See "Connection for audio system adjustment" in section 3-1-3.)
- Adjust the output level of audio generator so that the level at TP24 (GND: TP12) on the extension board is 220 mVp-p (−20 dBu).

Test Point : TP1 (GND: E1)/AFM-15 board
Adjustment Point : ⊘RV1 (INCOM DEV)/AFM-15 board
Specification : A=20.0 ± 0.8 kHz



Center frequency : 7.1 MHz
SPAN : 50 kHz
RBW : 1 kHz

3-3-7. DATA RF Adjustment

Note

- Be sure to use a non-inductive screwdriver for adjusting ⊘LV.

Equipment : Frequency counter
Test Point : TP5 (GND: E1)/AFM-15 board
Adjustment Point : ⊘LV4 (5.6 MHz)/AFM-15 board
Specification : 5,600 ± 5 kHz

3-3-8. INCOM Demodulation Adjustment

Note

- Perform this adjustment only when ⊘T202 and ⊘T203 on the AFM-15 board have been replaced.
- Be sure to use a non-inductive screwdriver for adjusting ⊘T.

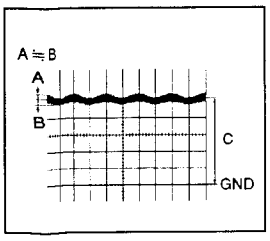
Equipment : Oscilloscope, Audio generator, Distortion meter
To be extended : AA-90 board (CCU-TX7/TX7P) AFM-15 board

Preparations:

- CCU-TX7/TX7P setting
  1) Extend the AA-90 board of the CCU-TX7/TX7P with extension board.
  2) INTERCOM (LINE: CH1/PRIV/CH2)/CCU-TX7/TX7P front panel → PRIV

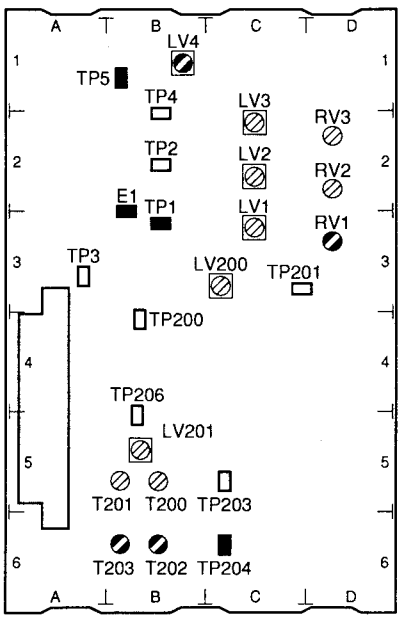
Adjustment Procedures:

1. Input an 1 kHz sine-wave signal from the audio generator to pin 2 (X) and pin 1 (G) of an INTERCOM connector of the CCU-TX7/TX7P front panel. (See "Connection for audio system adjustment" in section 3-1-3.)
2. Adjust the output level of audio generator so that level at TP66 (GND: TP65) on the extension board (AA-90 board) is 220 mVp-p.
3. Connect an oscilloscope to TP204 (GND: E1) on the AFM-15 board.
4. Slowly turn the core of ⊘T202 to display the sine waveform around 4.9 Vdc on the oscilloscope. Adjust ⊘T202 until it meets the following specification.
   Adjustment Point : ⊘T202/AFM-15 board
   Specification : C=4.9 ± 0.1 Vdc



5. **Test Point** : TP21 (GND: TP30)/Extension board (AFM-15 board)
   Adjustment Point : ⊘T203/AFM-15 board
   Specification : Minimum distortion (less than 0.5%)

6. Repeat steps 4 and 5 several times until the specifications are met.



AFM-15 BOARD (A SIDE)

3-3-9. PGM Demodulation Adjustment

Note

- Perform this adjustment only when ⊘T200 and ⊘T201 on the AFM-15 board have been replaced.
- Be sure to use a non-inductive screwdriver for adjusting ⊘T.

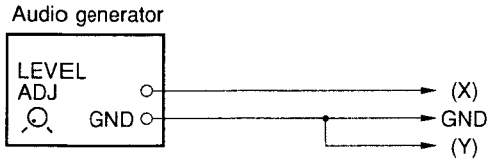
Equipment : Oscilloscope, Audio generator, Distortion meter
To be extended : AA-90 board (CCU-TX7/TX7P) AFM-15 board

Preparations:

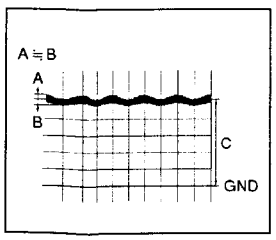
- CCU-TX7/TX7P setting
  1) Extend the AA-90 board of the CCU-TX7/TX7P with extension board.
  2) S2081 (PGM IN 0 dB/−20 dB)/AA-90 board → −20 dB

Adjustment Procedures:

1. Input an 1 kHz sine-wave signal from the audio generator to pin 94 (X), pin 93 (Y), and pin 92 (GND) of an extension board of the AA-90 board.



2. Adjust the output level of audio generator so that level at TP44 (GND: E12) on the extension board (AA-90 board) is 220 mVp-p.
3. Connect an oscilloscope to TP203 (GND: E1) on the AFM-15 board.
4. Slowly turn the core of ⊘T200 to display the sine waveform around 4.9 Vdc on the oscilloscope. Adjust ⊘T200 until it meets the following specification.
   Adjustment Point : ⊘T200/AFM-15 board
   Specification : C=4.9 ± 0.1 Vdc



5. **Test Point** : TP29 (GND: TP30)/Extension board (AFM-15 board)
   Adjustment Point : ⊘T201/AFM-15 board
   Specification : Minimum distortion (less than 0.5%)

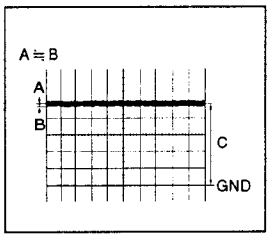
6. Repeat steps 4 and 5 several times until the specifications are met.

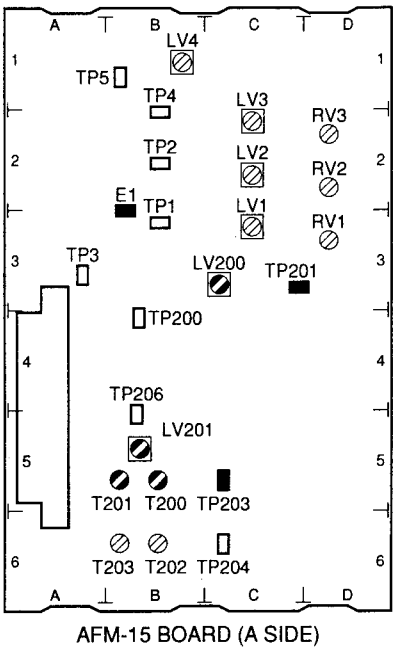
3-3-10. DATA Demodulation Adjustment

Note

- Be sure to use a non-inductive screwdriver for adjusting ⊘LV.

Equipment : Oscilloscope
Test Point : TP201 (GND: E1)/AFM-15 board
Adjustment Point : ⊘LV200/AFM-15 board
Specification : C=4.9 ± 0.1V





AFM-15 BOARD (A SIDE)

3-3-11. H CONT Demodulation Adjustment

Note

- Be sure to use a non-inductive screwdriver for adjusting ⊘LV.

Equipment : Digital voltmeter or Oscilloscope, Variable dc power supply, Frequency counter
To be extended : AFM-15 board

Preparations:

- Turn off the power of CA-TX7/TX7P.
- CCU-TX7/TX7P setting
  1) Remove ES-20 board from the CCU-TX7/TX7P.
  2) Extend the AA-90 board of the CCU-TX7/TX7P with extension board.
  3) Supply about +2.5 Vdc from the variable dc power supply to TP48 (GND: E1) on the extension board for the AA-90 board.
  4) Connect frequency counter to TP1 (GND: E1) on the AA-90 board and adjust the variable dc power supply so that the frequency becomes 3,000 ± 5 kHz.

Test Point : TP206 (GND: E1)/Extension board (AFM-15 board)

Adjustment Procedures:

1. Turn on the power of CA-TX7/TX7P.
2. **Adjustment Point** : ⊘LV201/AFM-15 board
   Specification : 4.9 ± 0.1V

Note: After this adjustment is completed, set as follows.

- Install the ES-20 board into the CCU-TX7/TX7P.

3-4. YM-15 BOARD ADJUSTMENT

Before the adjustment, prepare the completely aligned CCU-TX7/TX7P. Regarding connection and initial setting, refer to sections 3-1-3 and 3-1-4.

3-4-1. VCO 45 MHz Adjustment

Note

- Warm up the unit sufficiently (about 10 to 30 minutes) before performing the adjustment.

Equipment : Frequency counter
Test Point : TP9 (GND: E1)/YM-15 board
Adjustment Point : ⊘RV13 (VCO ADJ)/YM-15 board
Specification : 45,000,000 ± 10 Hz

3-4-2. Y Level Adjustment

Equipment : Oscilloscope
To be extended : YM-15 board

Preparations:

- Select the BARS mode on the RCP-TX7 or COU-TX7.

Adjustment:

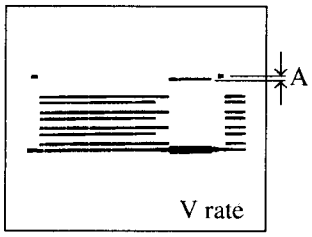
- For DXC-D30 (NTSC), DXC-D30P (PAL) and DXC-637P (PAL)

Test Point : TP1 (GND: E1)/YM-15 board
Adjustment Point : ⊘RV302 (Y SAMPLE LEVEL) /YM-15 board
Specification : A=0 ± 2 mV

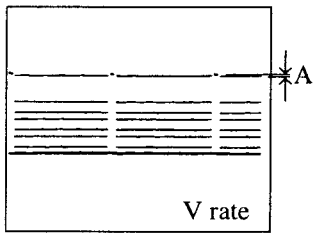
- For DXC-637 (NTSC)

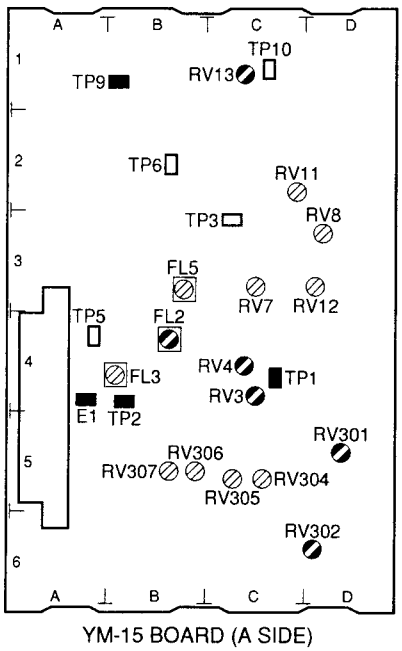
Test Point : TP1 (GND: E1)/YM-15 board
Adjustment Point : ⊘RV301 (Y LEVEL)/YM-15 board
Specification : A=0 ± 2 mV

For NTSC



For PAL





YM-15 BOARD (A SIDE)

3-4-3. Y/SKIN DC Balance Adjustment

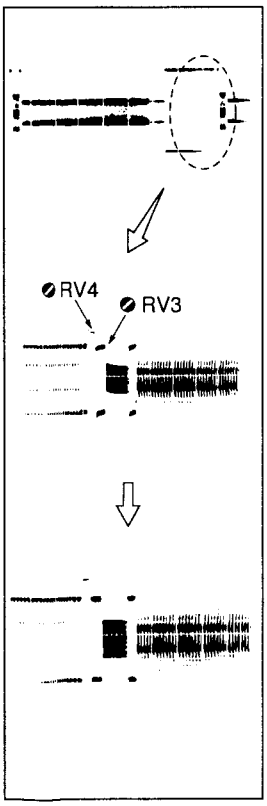
Equipment : Oscilloscope (LIMITER → OFF)
To be extended : YM-15 board

Preparations:
- Select the BARS mode on the RCP-TX7 or COU-TX7.

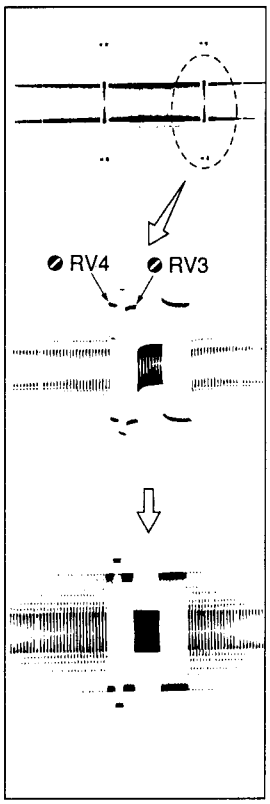
Test Point : TP2 (GND: E1)/YM-15 board
Trigger : SYNC OUTPUT connector/CCU rear panel
Adjustment Point : ⊘RV3 (Y DC BAL)/YM-15 board
⊘RV4 (SKIN DC BAL)/YM-15 board

Adjustment Procedures:
Adjust ⊘RV3 and ⊘RV4 alternately so that V SYNC portion is flat.

For NTSC



For PAL

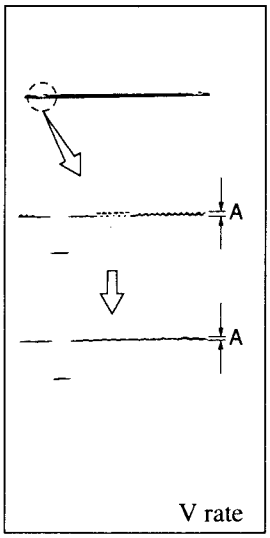


3-4-4. Y/SKIN 90° Adjustment

Note
- Perform this adjustment only when ⊘FL2 on the YM-15 board has been replaced.
- Be sure to use a non-inductive screwdriver for adjusting ⊘FL.

Equipment : Oscilloscope
To be extended : YM-15 board

Test Point : TP26 (GND: E5)/YD-26 board
Trigger : SYNC OUTPUT connector/CCU rear panel
Adjustment Point : ⊘FL2/YM-15 board
Specification : A=0 ±2 mV



3-4-5. R-Y Level Adjustment

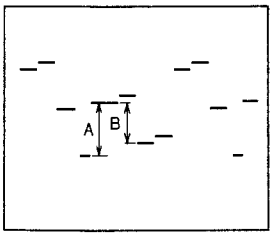
Equipment : Oscilloscope
To be extended : YM-15 board

Preparations:
• Select the BARS mode on the RCP-TX7 or COU-TX7.

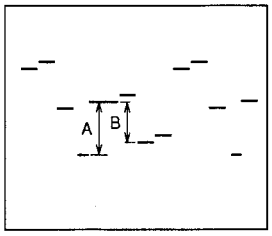
Adjustment:
• For DXC-D30 (NTSC),
DXC-D30P (PAL) and DXC-637P (PAL)
Test Point : TP3 (GND: E1)/YM-15 board
Adjustment Point : ⊘RV305 (R-Y SAMPLE LEVEL)/ YM-15 board
Specification : B=75 ± 1% (A=100%)

• For DXC-637 (NTSC)
Test Point : TP3 (GND: E1)/YM-15 board
Adjustment Point : ⊘RV304 (R-Y LEVEL)/YM-15 board
Specification : B=75 ± 1% (A=100%)

For NTSC



For PAL



3-4-6. B-Y Level Adjustment

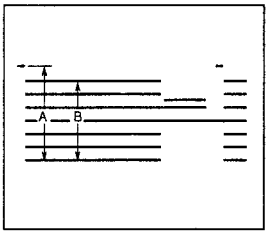
Equipment : Oscilloscope
To be extended : YM-15 board

Preparations:
• Select the BARS mode on the RCP-TX7 or COU-TX7.

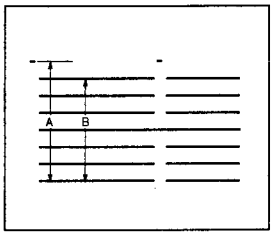
Adjustment:
• For DXC-D30 (NTSC),
DXC-D30P (PAL) and DXC-637P (PAL)
Test Point : TP6 (GND: E1)/YM-15 board
Adjustment Point : ⊘RV307 (B-Y SAMPLE LEVEL)/ YM-15 board
Specification : B=75 ± 1% (A=100%)

• For DXC-637 (NTSC)
Test Point : TP6 (GND: E1)/YM-15 board
Adjustment Point : ⊘RV306 (B-Y LEVEL)/YM-15 board
Specification : B=75 ± 1% (A=100%)

For NTSC



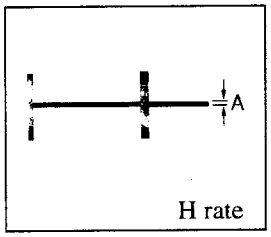
For PAL

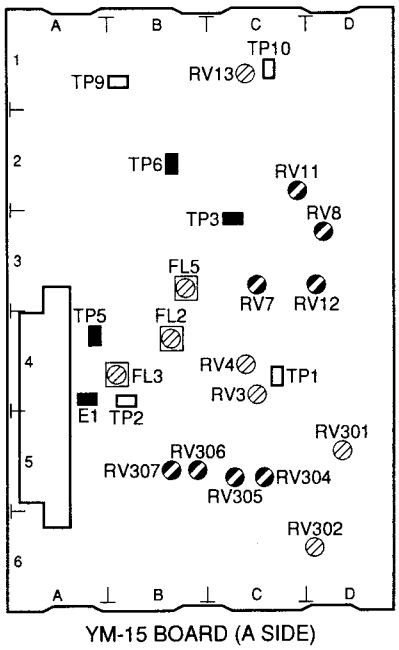


3-4-7. R-Y/B-Y Carrier Balance Adjustment

Equipment : Oscilloscope (LIMITER → OFF)
To be extended : YM-15 board
Test Point : TP5 (GND: E1)/YM-15 board
Adjustment Point : ⊘RV7 (R-Y CAL BAL)/YM-15 board
⊘RV11 (B-Y CAL BAL)/YM-15 board

Adjustment Procedures:
Adjust ⊘RV7 and ⊘RV11 alternately so that the amplitude "A" is minimum.





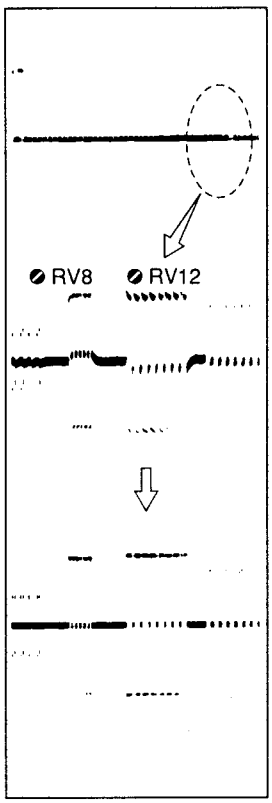
YM-15 BOARD (A SIDE)

3-4-8. R-Y/B-Y DC Balance Adjustment

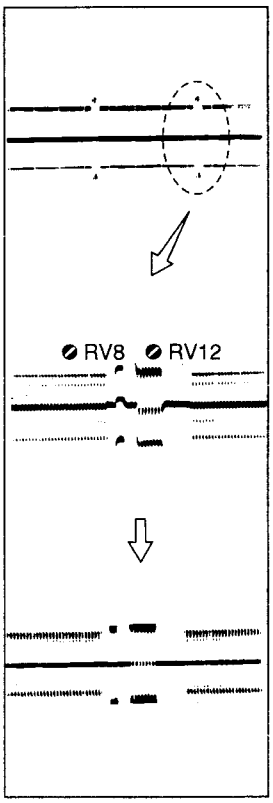
Equipment : Oscilloscope (LIMITER → OFF)
To be extended : YM-15 board
Test Point : TP5 (GND: E1)/YM-15 board
Adjustment Point : ⊘RV8 (R-Y DC BAL)/YM-15 board
⊘RV12 (B-Y DC BAL)/YM-15 board

Adjustment Procedures:
Adjust ⊘RV8 and ⊘RV12 alternately so that the V BLKG portion is flat.

For NTSC



For PAL



3-4-9. R-Y/B-Y 90° Adjustment

Note

- Perform this adjustment only when ⊘FL5 on the YM-15 board has been replaced.
- Be sure to use a non-inductive screwdriver for adjusting ⊘FL.

Equipment : Digital voltmeter or Oscilloscope (DC mode)
To be extended : YD-26 board (CCU-TX7/TX7P)
YM-15 board (CA-TX7/TX7P)

Preparations:

- CCU-TX7/TX7P setting
  Extend the YD-26 board of the CCU-TX7/TX7P with extension board.

Test Point : TP18 (GND: E12)/YD-26 board
Adjustment Point : ⊘FL5/YM-15 board

Adjustment Procedures:
Adjust ⊘FL5 so that the negative absolute value of the dc voltage is maximum.

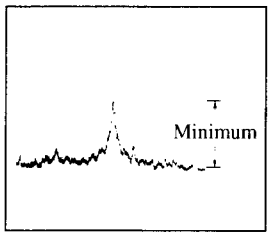
3-4-10. 67.5 MHz Trap Adjustment

Note

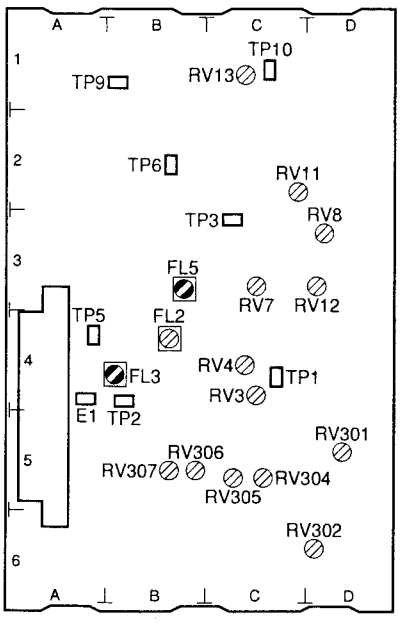
- Perform this adjustment only when ⊘FL3 on the YM-15 board has been replaced.
- Be sure to use a non-inductive screwdriver for adjusting ⊘FL.

Equipment : Spectrum analyzer
To be extended : YM-15 board
Test Point : TP13 (GND: E1)/Extension board (YM-15 board)
Adjustment Point : ⊘FL3 (67.5 MHz TRAP)/YM-15 board

Adjustment Procedures:
Adjust ⊘FL3 so that the level of 67.5 MHz signal component is minimum.



Center frequency : 67.5 MHz
SPAN : 2.0 MHz



YM-15 BOARD (A SIDE)

3-5. YD-25 BOARD ADJUSTMENT

Before the adjustment, prepare the completely aligned YD-25 board on the CA-TX7/TX7P.
Regarding connection and initial setting, refer to sections 3-1-3 and 3-1-4.

3-5-1. Return Video Demodulation Adjustment

Note

- Perform this adjustment only when replacing the YD-25 board or ⊘LV1 and ⊘LV2 on the YD-25 board.
- Be sure to use a non-inductive screwdriver for adjusting ⊘LV.
- When performing this adjustment, the TRIAX cable 300 m to 750 m should be used.

Equipment : Waveform monitor, Vectorscope, Video signal generator (10 STEP signal)
To be extended : YD-25 board

Preparations:

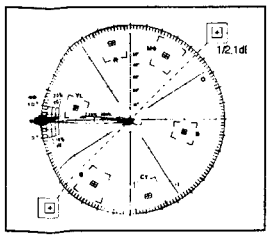
- Input the 10 STEP signal (SUBCARRIER:ON) of the video signal generator to RETURN VIDEO 1 INPUT connector at the rear panel of the CCU-TX7/TX7P.
- Press RETURN 1 switch at the side panel of the CA-TX7 TX7P.

Test Point : RETURN OUT connector/CA-TX7/ TX7P
Adjustment Point : ⊘LV1 (RET FREQ)/YD-25 board
⊘LV2 (RET TUNE)/YD-25 board

Adjustment Procedures:

1. Observe the waveform monitor and adjust ⊘LV2 temporarily until the video waveform appears on the screen.
2. Observe the vectorscope and adjust ⊘LV1 to minimize the beam spot size on the screen.
3. In order to obtain more smaller beam spot size, turn ⊘LV2 a little.
4. Adjust ⊘LV1 and ⊘LV2 alternately until the DG and DP on the vectorscope are minimum.

Specification: DG = ±5%, DG = ±5°



CA-TX7 (E)/V1

3-5-2. Return VBS Level Adjustment

Equipment : Waveform monitor
To be extended : YD-25 board

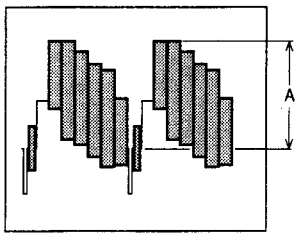
Preparation:

- Select the BARS mode on the RCP-TX7 or COU-TX7.
- S2 (RET/VBS)/YD-25 board → VBS

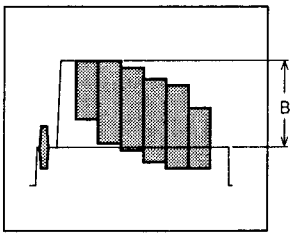
Test Point : RETURN OUT connector/CA-TX7/TX7P

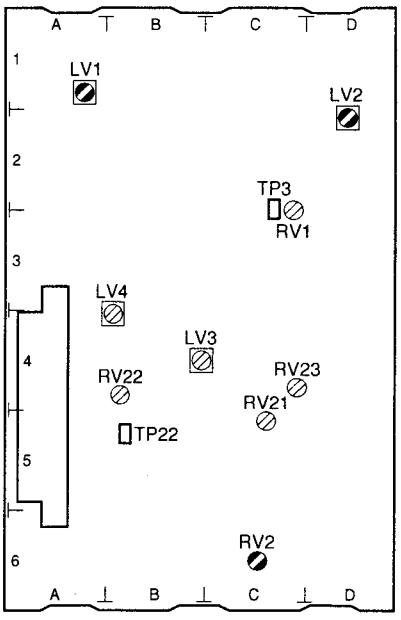
Adjustment Procedure : ⊘RV2 (RET VBS LEVEL)/YD-25 board
Specification : A =100 ± 3 IRE (NTSC)
B =700 ± 20 mV (PAL)

For NTSC



For PAL





YD-25 BOARD (A SIDE)

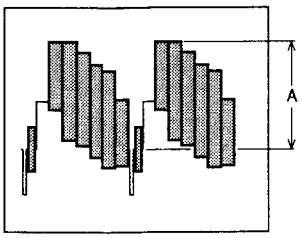
3-5-3. Return Video Level Adjustment

Equipment : Waveform monitor
To be extended : YD-25 board

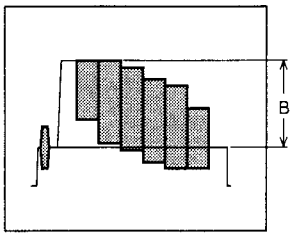
Preparation:
- Select the BARS mode on the RCP-TX7 or COU-TX7.
- S2 (RET/VBS)/YD-25 board → RET
- CCU-TX7/TX7P setting.
  Connect the VBS 2 OUTPUT connector and RETURN VIDEO 1 INPUT connector at the rear panel of the CCU-TX7/TX7P, and set the termination 75 Ω switch to ON position.

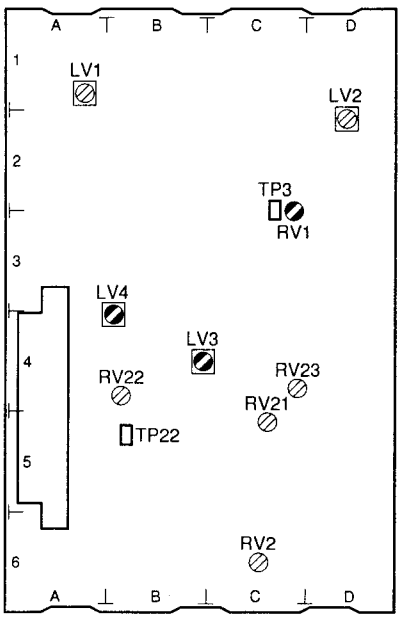
Test Point : RETURN OUT connector/CA-TX7/TX7P
Adjustment Point : ◐RV1 (RET LEVEL)/YD-25 board
Specification : A =100 ± 3 IRE (NTSC)
B =700 ± 20 mV (PAL)

For NTSC



For PAL





YD-25 BOARD (A SIDE)

3-5-4. RX PROMPT VIDEO Demodulation Adjustment

Note

- Perform this adjustment only when replacing ⊘LV2 (PROMPT FREQ) or ⊘LV3 (PROMPT TUNE) on the YD-25 board.
  When perfoming this adjustment, the TRIAX cable less than 300 m should be used.
- Adjustment of CCU-TX7/TX7P must be completed.

Equipment : Waveform monitor,
Video signal generator (SWEEP signal, 10 STEP signal)

To be extended : YD-25 board

Preparation:

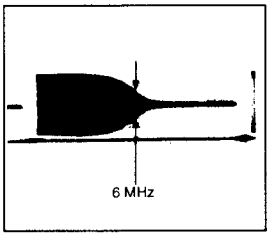
- S1 (AUX/PROMPT)/YD-25 board (CA-TX7/TX7P) → PROMPT
- S6 (AUX/PROMPT)/YD-25 board (CA-TX7/TX7P) → PROMPT
- Connect CN7 and CN3 on the CT-181 board (CCU-TX7/TX7P).
- S2002 (TX RX)CT-181 board (CCU-TX7/TX7P) → TX
- Input the SWEEP signal of the video signal generator to PROMPT VIDEO connector at the rear panel of the CCU-TX7/TX7P.

Test Point : PROMPTER OUT connector (CA-TX7/TX7P)
Note : To measure the video level, make 75 Ω termination on the waveform monitor side.

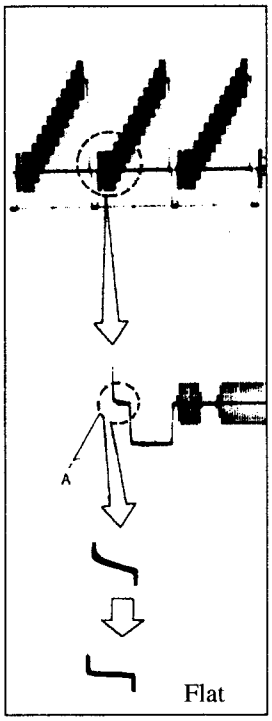
Adjustment Point : ⊘LV3 (PROMPT TUNE)/YD-25 board
⊘LV4 (PROMPT FREQ)/YD-25 board

Adjusting Prcedure:

1. Observe the waveform monitor screen and adjust ⊘LV3 (PROMPT TUNE) on the YD-25 board temporarily so that the video waveform is appeared.
2. Observe the waveform monitor screen and adjust ⊘LV4 (PROMPT FREQ) on the YD-25 board so that the frequency response at 6 MHz portion is minimum.



3. Change the output signal of the video signal generator to 10 STEP (SUB CARRIER: ON)signal.
4. Re-adjust ⊘LV3 (PROMPT TUNE)/YD-25board so that the A portion at video waveform becomes flat. If not met, re-perform 3-5-4. RX PROMPT VIDEO Demod Adjustment after performing 3-5-5. RX PROMPT VIDEO RF AGC Adjustment.



3-5-5. RX PROMPT VIDEO RF AGC Adjustment

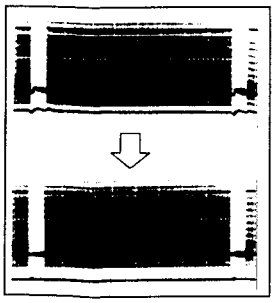
Note : When perform this adjustment, the TRIAX cable 50 m to 150 m should be used .
Adjustment of CCU-TX7/TX7P must be completed.

Equipment : Oscilloscope,
Video signal generator (10 STEP signal)
To be extended : YD-25 board

Preparation:
- S1 (AUX/PROMPT)/YD-25 board (CA-TX7/TX7P) → PROMPT
- S6 (AUX/PROMPT)/YD-25 board (CA-TX7/TX7P) → PROMPT
- Connect CN7 and CN3 on the CT-181 board (CCU-TX7/TX7P).
- S2002 (TX↔RX)/CT-181 board (CCU-TX7/TX7P) → TX
- Input the 10 STEP signal (SUBCARRIER:ON) of the video signal generator to PROMPTER IN connector at the rear panel of the CCU-TX7/TX7P.

Test Point : PROMPTER OUT connector (CA-TX7/TX7P)
Note : To measure the video level, make 75Ω termination on the waveform monitor side.
Adjustment Point : ⊘RV22 (RF AGC DLY)/YD-25 board

Adjustment Procedure :
Turn ⊘RV22 (RF AGC DLY) on the YD-25 board fully in the clockwise direction.
Then turn it slowly in the counterclockwise direction so that the V SYNC position of waveform becomes flat.
(Take care not to over-turn.)



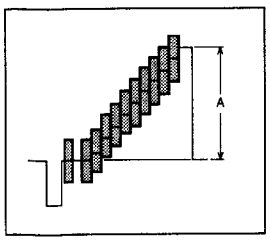
3-5-6. RX PROMPT VIDEO Level Adjustment

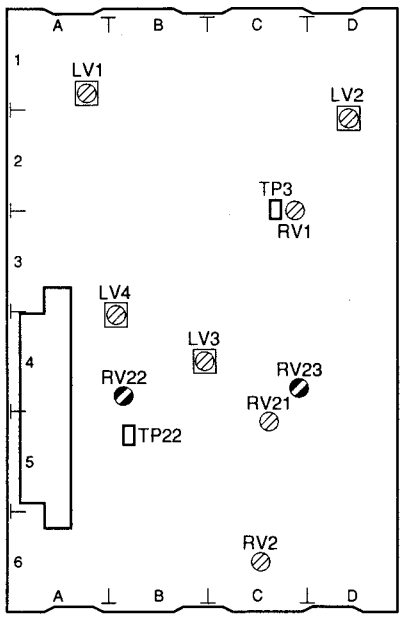
Note : When performing this adjustment, the TRIAX cable of less than 300 m should be used.
Adjustment of CCU-TX7/TX7P must be completed.

Equipment : Waveform monitor,
Video signal generator (10 STEP signal)
To be extended : YD-25 board

Preparation:
- S1 (AUX/PROMPT)/YD-25 board (CA-TX7/TX7P) → PROMPT
- S6 (AUX/PROMPT)/YD-25 board (CA-TX7/TX7P) → PROMPT
- Connect CN7 and CN3 on the CT-181 board (CCU-TX7/TX7P).
- S2002 (TX↔RX)/CT-181 board (CCU-TX7/TX7P) → TX
- Input the 10 STEP signal (SUBCARRIER:ON) of the video signal generator to PROMPTER IN connector at the rear panel of the CCU-TX7/TX7P.

Test Point : PROMPTER OUT connector (CA-TX7/TX7P)
Note : To measure the video level, make 75Ω termination on the waveform monitor side.
Adjustment Point : ◐RV23 (PROMPT LEVEL)/YD-25 board
Specification : A =100 ± 3 IRE (NTSC)
: A =700 ± 20 mV (PAL)





YD-25 BOARD (A SIDE)

3-5-7. TX PROMPT VIDEO Demodulation Adjustment

Note : When performing this adjustment, the TRIAX cable of less than 300 m should be used.

Equipment : Waveform monitor, Video signal generator (10 STEP signal

To be extended : YD-25 board

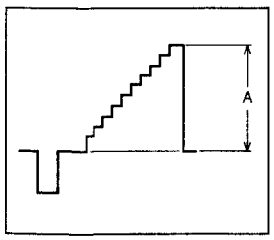
Preparation:

- S1 (AUX/PROMPT)/YD-25 board (CA-TX7/TX7P) → AUX
- S6 (AUX/PROMPT)/YD-25 board (CA-TX7/TX7P) → AUX
- Connect CN8 and CN3 on the CT-181 board (CCU-TX7/TX7P).
- S2002 (TX↔RX)/CT-181 board (CCU-TX7/TX7P) → RX
- Input the 10 STEP signal (SUBCARRIER:OFF) of the video signal generator to PROMPTER OUT connector (75Ω termination, 1.0 Vp-p) at the rear panel of the CA-TX7/TX7P.

Test Point : PROMPT VIDEO (CCU-TX7/TX7P)
Note : To measure the video level, make 75Ω termination on the waveform monitor side.

Adjustment Point : ⊘RV21 (PROMPT DEV)/YD-25 board

Specification : A =100 ± 3 IRE (NTSC)
: A =700 ± 20 mV (NTSC)



Note : After this adjustment is completed, set as follows.

- S1 (AUX/PROMPT)/YD-25 board (CA-TX7/TX7P) → PROMPT
- S6 (AUX/PROMPT)/YD-25 board (CA-TX7/TX7P) → PROMPT
- Connect CN7 and CN3 on the CT-181 board (CCU-TX7/TX7P).
- S2002 (TX↔RX)/CT-181 board (CCU-TX7/TX7P) → TX